InBody S10

InBody USER'S MANUAL

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Thank you for purchasing the InBody S10.

Please read this manual carefully and operate with care. Make sure to keep this manual for future reference.

BIOSPACE

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BM-ENG1-83-A-100305

Introducing the InBody S10

Body Composition consists of 4 major components: Water, Protein, Minerals and Fat. These four elements are the fundamental ingredients the body is comprised of, and it is important for them to be in balance. Body composition analysis is expected to quantify and measure these ingredients.

In the past, diagnosing obesity was focused on how we looked outside, without considering the balance among body water, protein, body fat and minerals. From the health point of view, body composition analysis that takes into account the balance between body water, protein, body fat and mineral makes more sense than diagnosing obesity based on how we look. In addition, this is where the body composition analyzer with high precision comes in.

Since 1996, Biospace has developed its resources and technology and has been recognized worldwide for its efforts. Biospace has upgraded its InBody system and has developed InBody S10. InBody S10 is a device that accurately measures the examinee's body composition levels including body water level, extracellular and intracellular body water level, as well as body water ratios and is used to research body water distribution. The accuracy of InBody S10 makes it a great index to assess the balance of body water levels.

With touch screen feature, InBody S10 is more convenient to use. It displays past measurement results as well as accumulative graphs that show the changes in the results. Also, InBody S10 can be loaded onto its specialized cart and can be moved conveniently. InBody S10 can be used while it is carried in the provided portable bag to offer more convenient use.

Biospace is committed to providing advanced equipment to promote good health and a long life.

Kichul Cha, CEO

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How to use this manual

This user's manual explains the functions of the InBody S10.
Follow the instructions below for effective use this manual.

1. Please read this manual thoroughly before you use InBody S10 and use it with proper operation.

2. Take a few moments to look at the pictures of instruction of this product to understand the configuration.

3. If you have clinical issues while using the InBody S10, please contact us using the e-mail address as shown below.
E-mail : info@biospace.co.kr TEL: 82-2-501-3939

4. Read symbols of warning, precautions and note carefully. The followings are the visual representations of these symbols.

The important information to warn you of situations which might cause major injury and/or damage to property if instructions are not carefully followed.

The important information to warn you of situations which might cause minor injury and/or damage to property if instructions are not carefully followed.

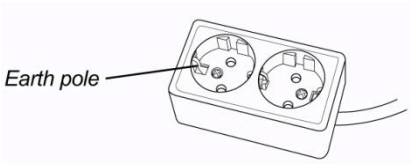
The important and helpful information for operation.

Safety Information

WARNING

1. Do not use this equipment in combination with the following electronic medical devices.
- Medical devices, such as a pacemaker
- Electronic life support systems, such as an artificial heart/lung
- Portable electronic medical devices, such as an electrocardiograph.

2. This product should always be placed on the ground and plugged into a secure electrical outlet.



3. Physically disabled persons or children should not attempt to take measurements alone, but instead should get help by having manager or guardian hold them from the side or the back not to slip or to measure incorrectly.

4. Do not insert and remove the power cord with wet hands.

5. To prevent fire or breakdown, please use a socket connected to appropriate power supply(100-240VAC). If the socket has several terminals, a socket or extension cable with enough electric capacity should be used.

6. To avoid electric shock, be sure to avoid contact between this product and other devices.

7. Do not dismantle the equipment or open the back cover. Internal parts are not for customer use. If the equipment is dismantled, the warranty is void, and service costs will be charged. If service is required, contact Biospace or the supplying agency.

8. Follow local governing ordinances and recycling plans regarding the disposal or recycling of device components.

9. This device should not be used on pregnant women. Besides providing readings that may be inaccurate, the effect on the fetus is unknown.

1. **Cross Contamination**
Individuals with any kind of contagious disease or infection must not use or come in contact with the equipment. Please be sure to clean the equipment with appropriate disinfectant after each use. Never pour any liquid directly on the equipment, as it may leak and cause internal damage. Use a soft cloth and appropriate ethyl alcohol to wipe off the equipment. Do not wipe the equipment with strong chemicals.

2. **Test result's interpretation and prescription**
Do not start weight control or exercise therapy without physician's prescription or expert's advice. Misguided self-diagnosis may harm your health. If you are pregnant, please consult with undertaking physician or an expert before use.

3. **Other equipments**
Please block electromagnetic interferences from other equipments. It may lead to inaccurate test result or error.

4. This product must be installed on a flat and no vibrated floor. If the floor is not even, it will affect a risk of stumbling when making measurements and cause incorrect measurement.

5. Be careful not to spill or drop any residues of food or beverages on this product. It may cause serious damage to the electronic components.

6. Do not move your body during measurement for accurate test result.

1. Wrong installation contrary to this manual's guidelines can cause error or inaccurate test result. Also other equipment's interference can be a cause. To solve the interference problem, you should

-Separate power supply from the equipments that cause interference.
-Stay away from the other equipments.
-Use the different power supply from the other equipment, only for InBody.
-Please contact Biospace if the problem continues.

2. Excessively high or low temperatures, humidity and pressure might affect on the equipment's operation and cause an error. Please use the equipment within the suggested specification range for equipment's use.

3. While moving, installing, or using this product, be sure to protect it against any physical shock or damage. Always use the packing material and the original shipping box when moving or transporting this product.

4. Use this equipment only for the purpose of body composition analysis.

5. Repair and examination should be conducted only by Biospace's professional A/S staff. Please contact Biospace if needed.

6. The InBody S10 fulfills the Standards of IEC60601-1(EN60601-1), Safety of Electric Medical Equipment. In addition, the InBody S20 complies not only with Level A for Noise Immunity, but also with Level A for Noise Emission by the Standard IEC60601-1-2(EN60601-1-2), Electromagnetic Compatibility Requirements.

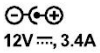
7. The InBody S10 has been designed, manufactured, and inspected under the full quality assurance system of Biospace. Biospace fulfills the international standardization system, ISO 90001 and ISO 13485.

Indicators & Safety Symbols

A. Indicators

	9 pin Serial Port, Female (RS-232C)		USB Port

B. Safety Symbols

	Waming / Caution / Note		BF Type Equipment
	Adapter		Power On
	Power Off		

Disposal of old Electrical & Electronic Equipment
(Application in the European Union and other European countries with separate collection system.) This symbol indicates that this product shall not be treated as household waste. Instead, it shall be handed over to the applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling this product, please refer to local governing ordinances and recycling plans.

Follow local government ordinances and recycling instructions regarding disposal or recycling of device components, including batteries.

Workplace Requirements

□ Operation Environment

Temperature range	10 ~ 40 ℃(50℉ ~ 104℉)
Relative humidity	30 ~ 75 %
Atmospheric pressure range	70 ~ 106 kPa

□ Storage Environment

Temperature range	-20 ~ 60 ℃(-4℉ ~ 140℉)
Relative humidity	10 ~ 95 % (No condensation)
Atmospheric pressure range	50 ~ 106 kPa

□ Adapter

Power Input	AC 100 ~ 240V, 50/60Hz, 1.2A
Power Output	DC 12V, 3.4A

Chapter1. Installation & Maintenance

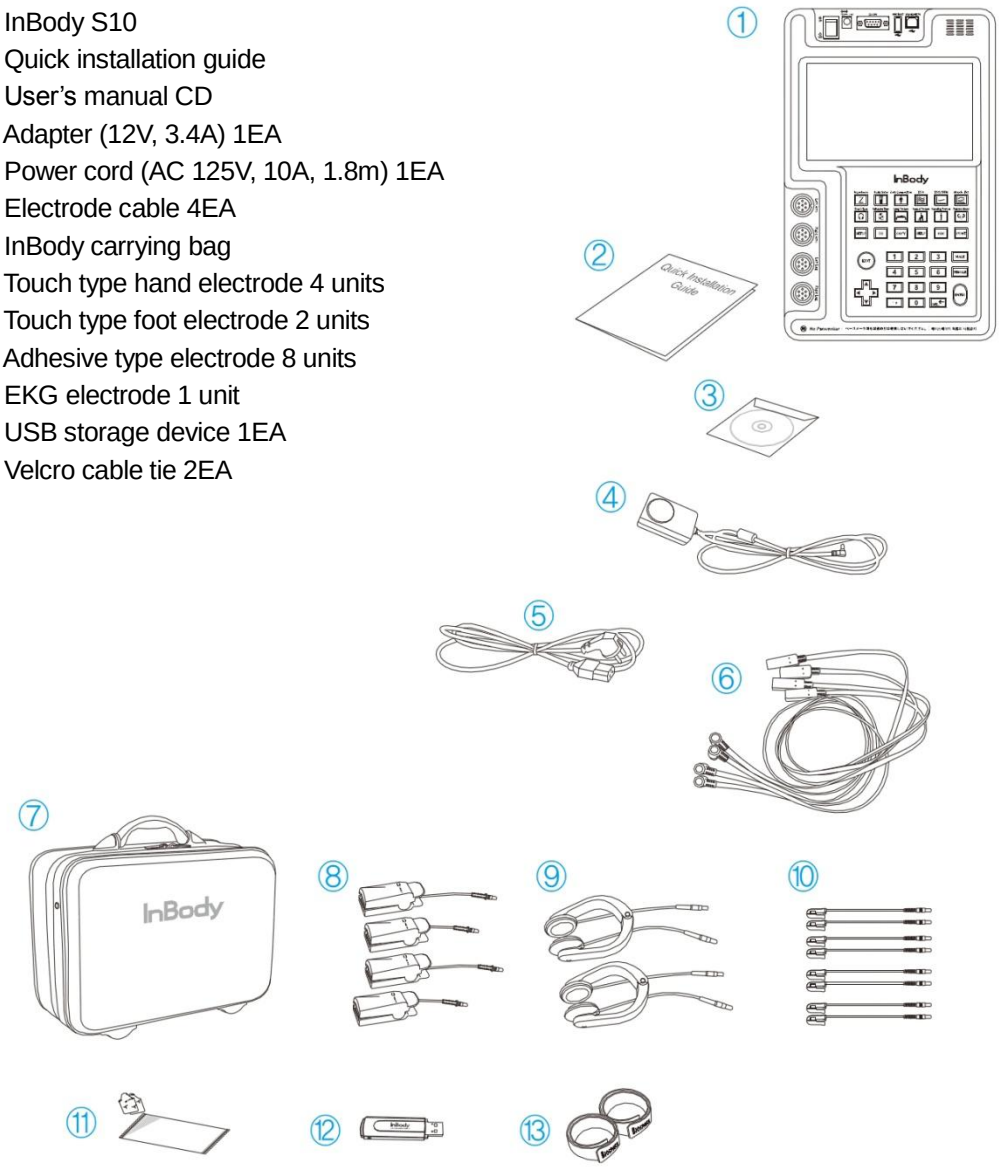
1. Contents of the box
2. Exterior & Functions
3. Installation Instructions
4. Transportation
5. Repacking
6. Maintenance

1. Contents of the box

When opening the box, make sure all of the following items are inside.

A. Included Items

① InBody S10
② Quick installation guide
③ User's manual CD
④ Adapter (12V, 3.4A) 1EA
⑤ Power cord (AC 125V, 10A, 1.8m) 1EA
⑥ Electrode cable 4EA
⑦ InBody carrying bag
⑧ Touch type hand electrode 4 units
⑨ Touch type foot electrode 2 units
⑩ Adhesive type electrode 8 units
⑪ EKG electrode 1 unit
⑫ USB storage device 1EA
⑬ Velcro cable tie 2EA

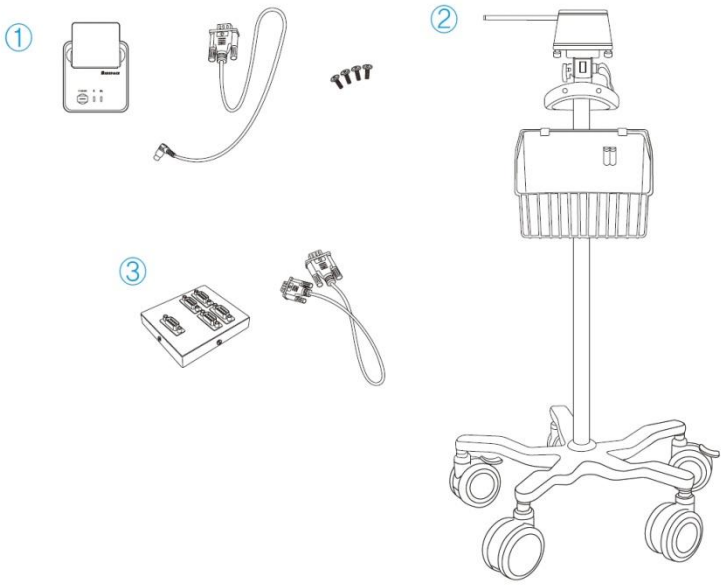


B. Optional

① Thermal printer 1EA , Cable, Screw 4EA

② Cart

③ SD400, Cable



CAUTION

To prevent physical shock, use Biospace's packing material when shipping or transporting the equipment. Refer to this Chapter, Section 4: "Transportation."

NOTE

If you desire to use InBody S10 and various optional equipment such as extensometers and blood pressure monitors, purchase ③SD400 (serial dispenser) separately.

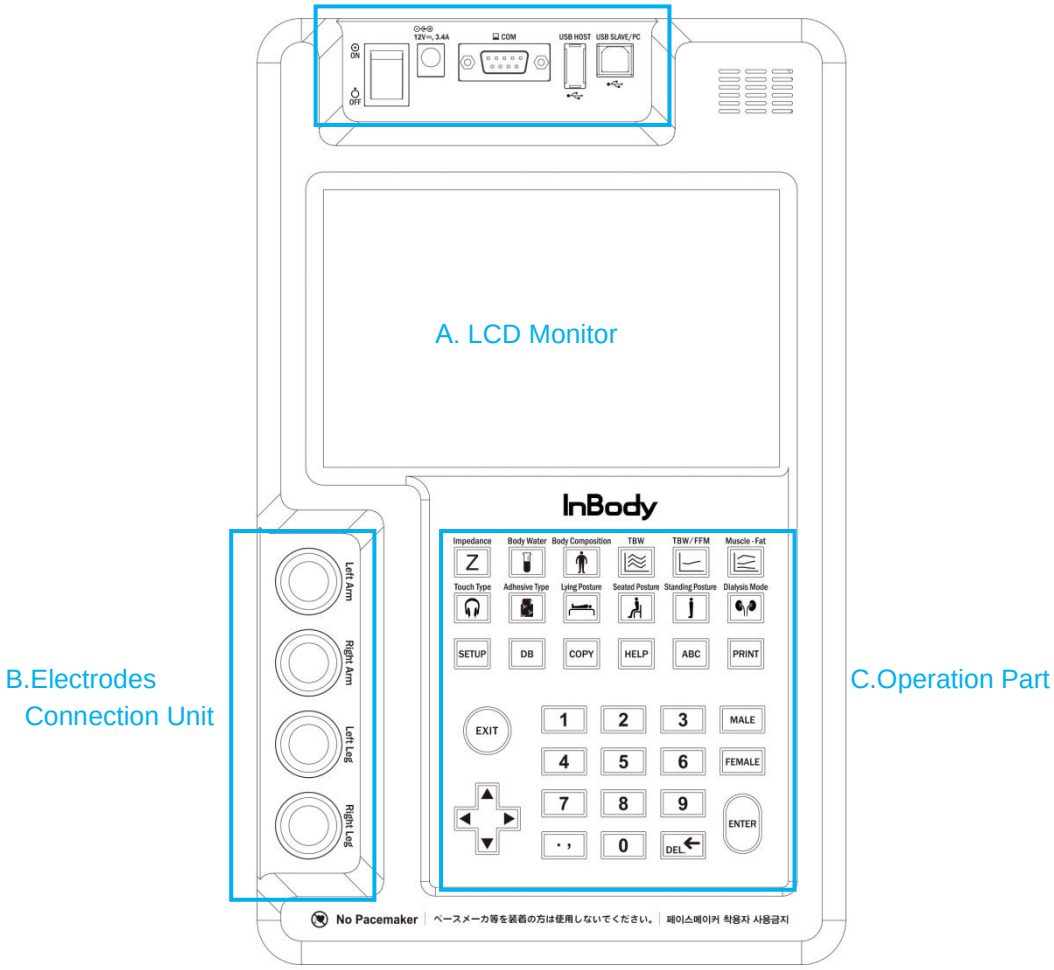
NOTE

Save the wrapping material after unpacking for the event of relocation.

2. Exterior & Functions

Individual part identification and functions with schematic sketches are provided below. Please inspect each component of the InBody S10 before installation to ensure there are no scratches or damage.

A. LCD Monitor
B. Electrodes Connection Unit
C. Operation Part
D. Control & Connection Unit



WARNING

Do not dismantle the equipment or open the back cover. Internal parts are not for customer use and may cause electric shock. If the equipment is dismantled, the warranty is void, and service costs will be charged.

A. LCD Monitor

Touch Screen LCD. This displays the analysis procedure, messages and results.

B. Electrodes Connection Unit

Connect electrodes cables into InBody's internal circuit.

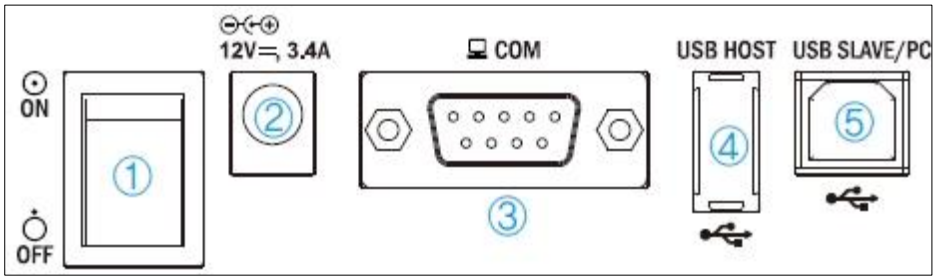
C. Operation Part

The keypad is divisible into input buttons function buttons.

The buttons are used to input data required for body composition analysis, set up the operating environment or to print out test results.

D. Control & Connection Unit

Connects to peripherals such as a PC or a printer for data transmission.



① Power Switch

Power the InBody S10 on/off.

② Power Input Port

Use to connect the power adapter.

③ 9pin Serial Port, Female (RS-232C)

Use to connect optional devices i.e. thermal printer or blood pressure monitor provided by Biospace.

SD400(Serial Distributor) provided by Biospace is for the connection of several optional devices.

④ USB Host Port

Use to interface with a USB printer or a USB storage device.

⑤ USB Slave Port

Use to connect with a PC.

Do not drop any food or liquid on the equipment. It may affect the electrical parts in the equipment or cause damage.

Use the adapter provided by Biospace only.

When you use the adapter cable, insert the adapter cable tightly into the InBody S10.

Including the optional equipment, only the peripherals provided by Biospace can be connected to the InBody S10. For any inquiry about peripherals, contact Biospace.

3. Installation Instructions

A. Workplace requirements

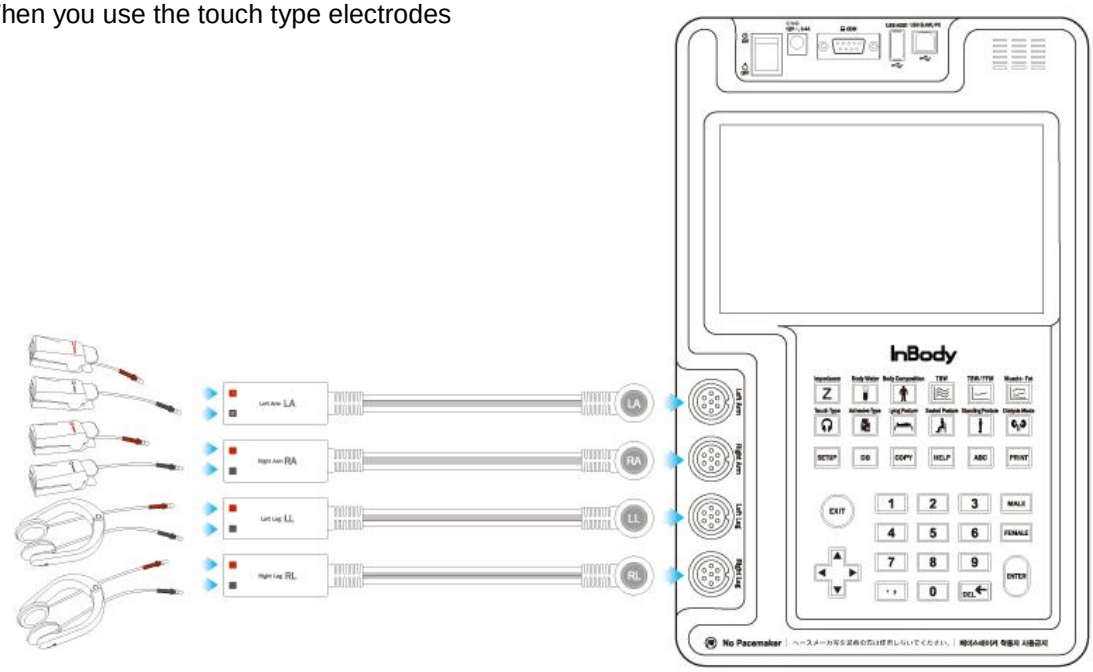
(1) Location: Indoor only. Any outdoor area where the equipment is to be located should meet all the conditions below.
(2) Operation environment: 10 ~ 40℃(50 ~ 104 °F), 30 ~ 75%RH, 70 ~ 106kPa
(3) Adapter: Power Input 100-240V, 50-60Hz, 1.2A Power Output DC 12V, 3.4A

B. For the InBody carrying bag users

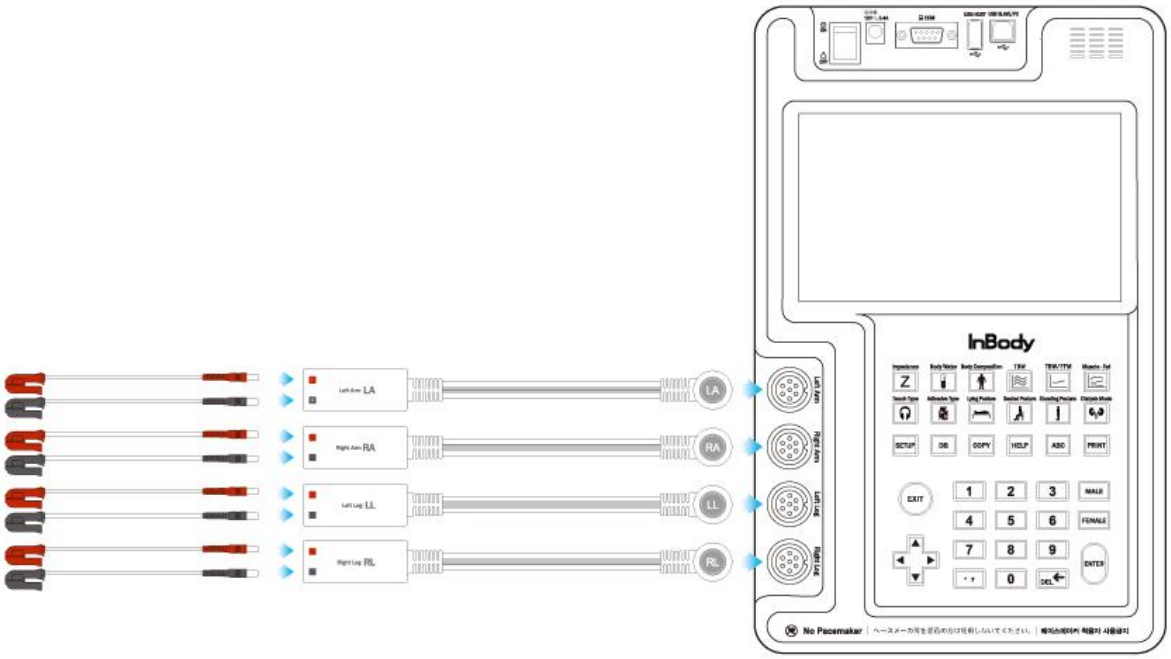
(1) When opening the box, check to make sure all the following items are inside.

(2) Connect the electrode cables to the InBody S10.
Connect electrodes of RA(Right Arm), LA(Left Arm), RL(Right Leg), LL(Left Leg) to each corresponding part of the InBody S10. InBody S10 offers two types of electrodes, that is, the Touch Type electrode and Adhesive Type electrode.

When you use the touch type electrodes



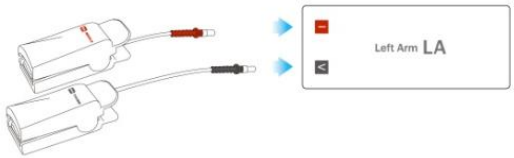
When you use the adhesive type electrodes



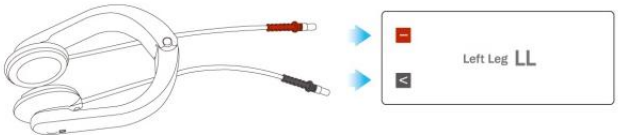
① Touch Type

Connect black cable to the black port(V) of the electrode module, and connect red cable to the red port(I) of the electrode module.

[hand electrode]



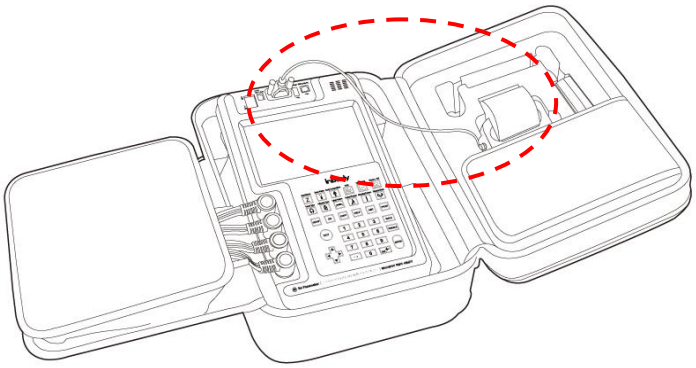
[foot electrode]



② Adhesive Type

Connect black cable to the black port(V) of the electrode module, and connect red cable to the red port(I) of the electrode module.

(3) Thermal printer cables are connected in the same manner as shown in the picture.



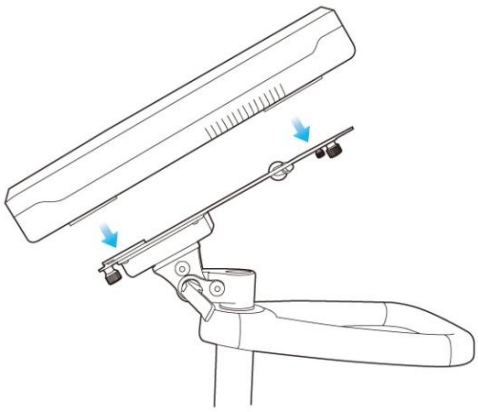
NOTE

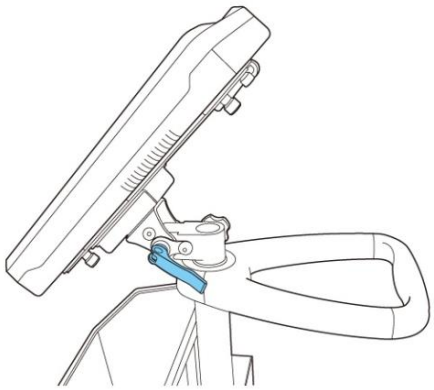
Thermal printers are sold separately.

C. How to install cart

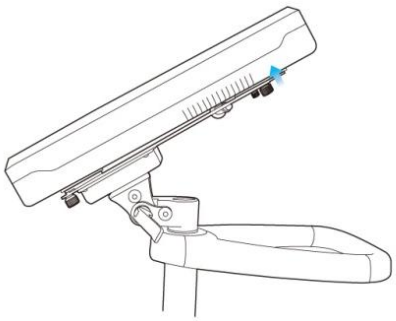
NOTE Cart is sold separately.

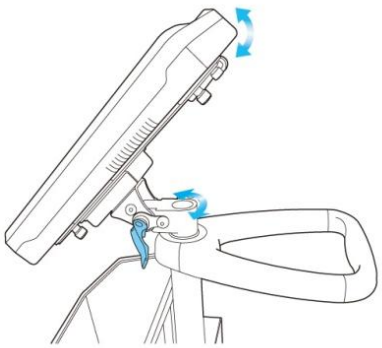
(1) Please place InBody S10 on the cart. Adjust InBody S10's 4 screws on the rear side of the unit to the cart's 4 grooves on the head unit. Screw them to fasten the InBody S10 onto the cart.

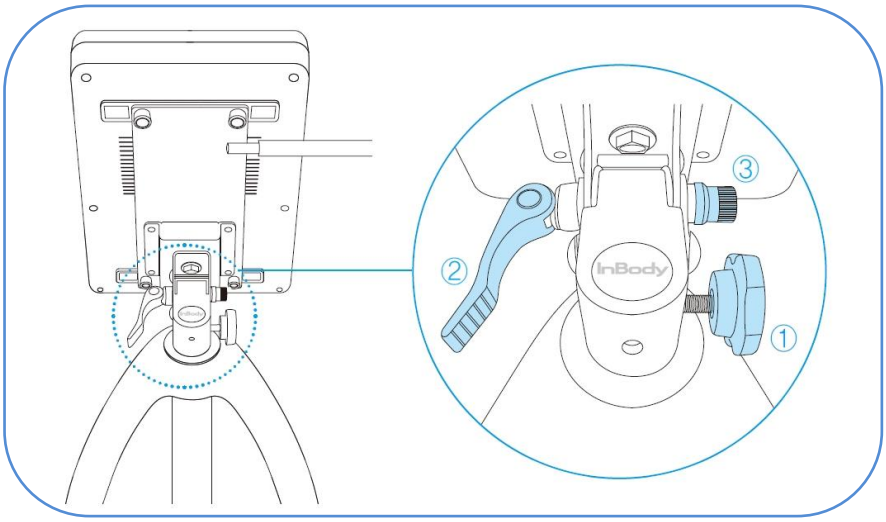




(2) Referring to below guidelines, adjust the direction and angles as you want.







◆ HELP

① : For left/right control

Loosen the screw and adjust left/right direction. Fasten the screw again.

② : For up/down control

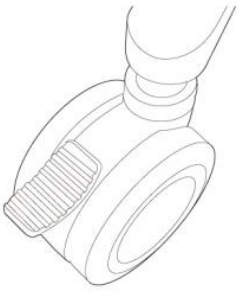
It is written as CLOSE/OPEN.

Loosen ② and adjust high/low degree. Fasten ② again.

③ : When ② is too tight or loose

If unscrewed, ② becomes loose. If screwed, ② becomes tight.

(3) After installation, you can lock the wheels by pushing down the locking lever(as illustrated below).



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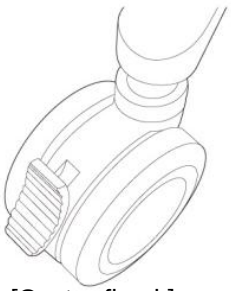
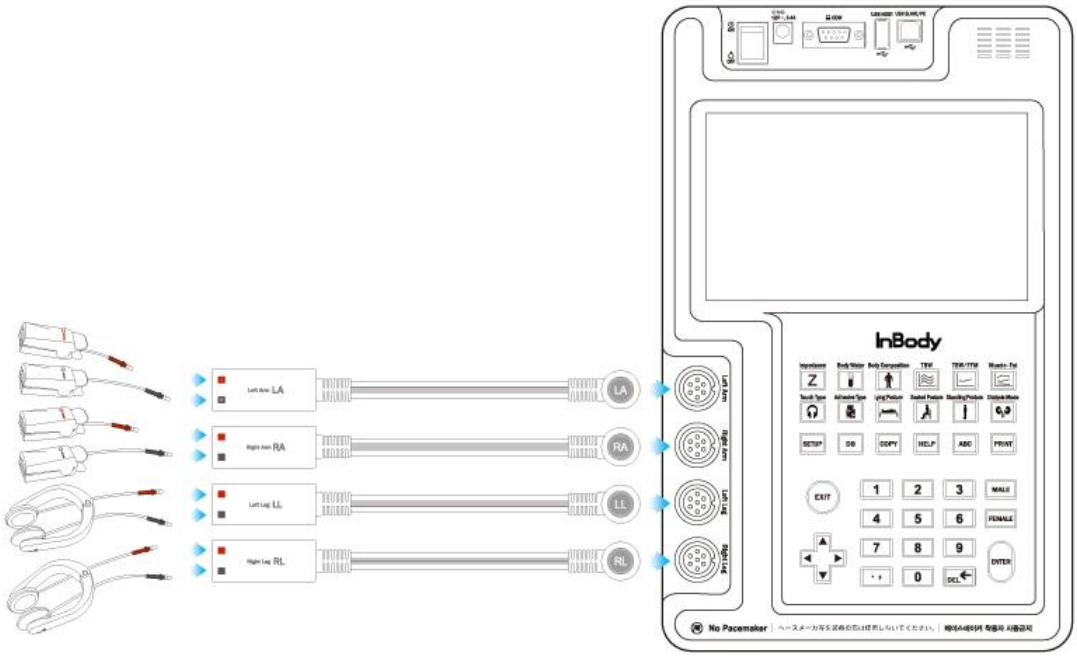


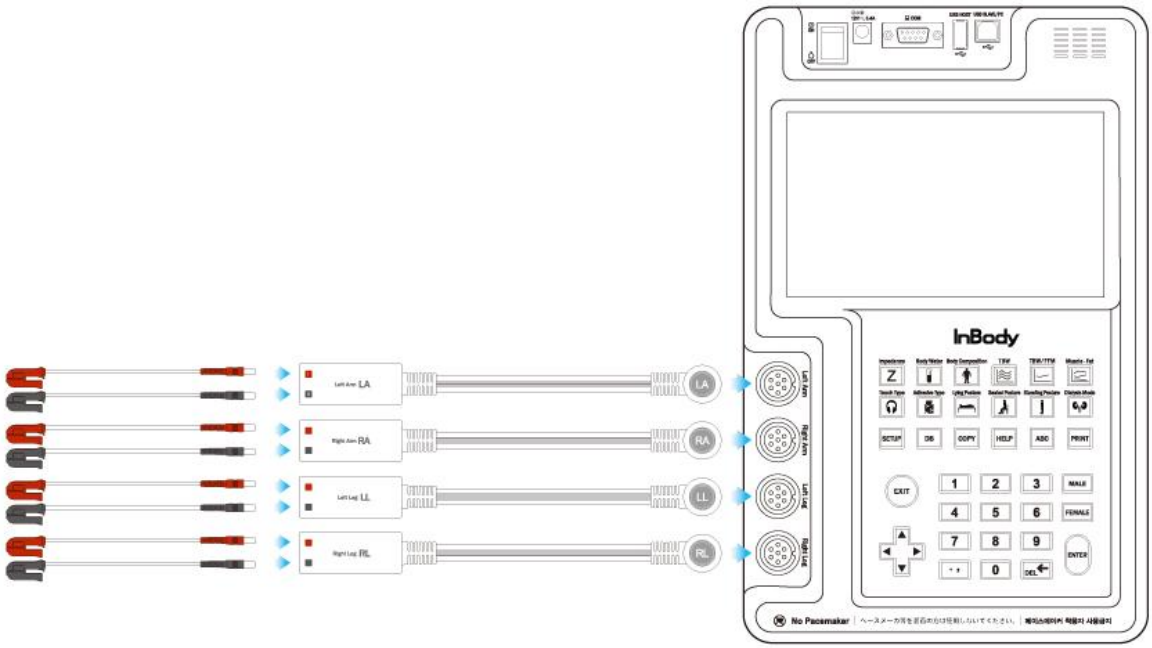
[Caster fixed.]

(4) Connect the electrode cables to the InBody S10.
Connect electrodes of RA(Right Arm), LA(Left Arm), RL(Right Leg), LL(Left Leg) to each corresponding part of the InBody S10. InBody S10 offers two types of electrodes, that is, the Touch Type electrode and Adhesive Type electrode.

When you use the touch type electrodes



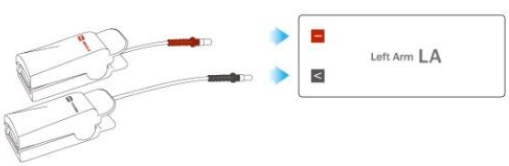
When you use the adhesive type electrodes

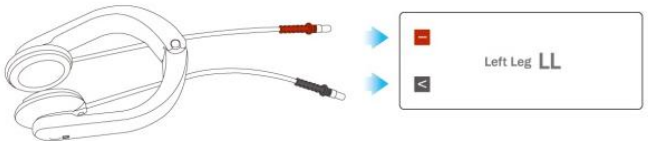


① Touch Type

Connect black cable to the black port(V) of the electrode module, and connect red cable to the red port(I) of the electrode module.

[hand electrode] [foot electrode]





② Adhesive Type electrode

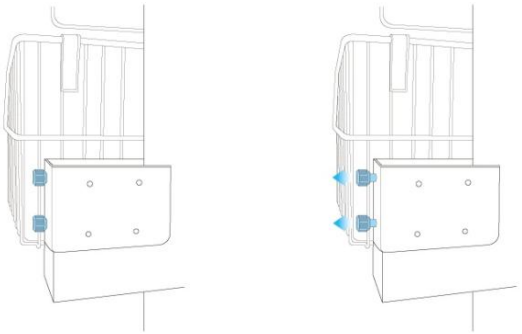
Connect black cable to the black port(V) of the electrode module, and connect red cable to the red port(I) of the electrode module.

(5) How to install thermal printer onto the cart

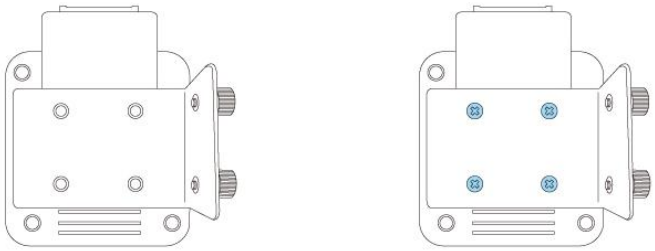
NOTE

Thermal printers are sold separately.

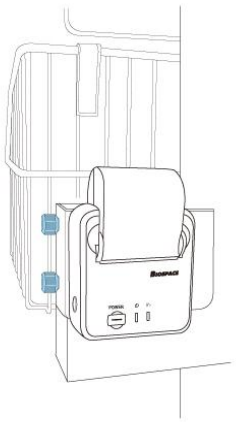
① Supporting metal plate is fixed on cart basket's rear side. When two screws are unscrewed, cart and basket becomes separated.



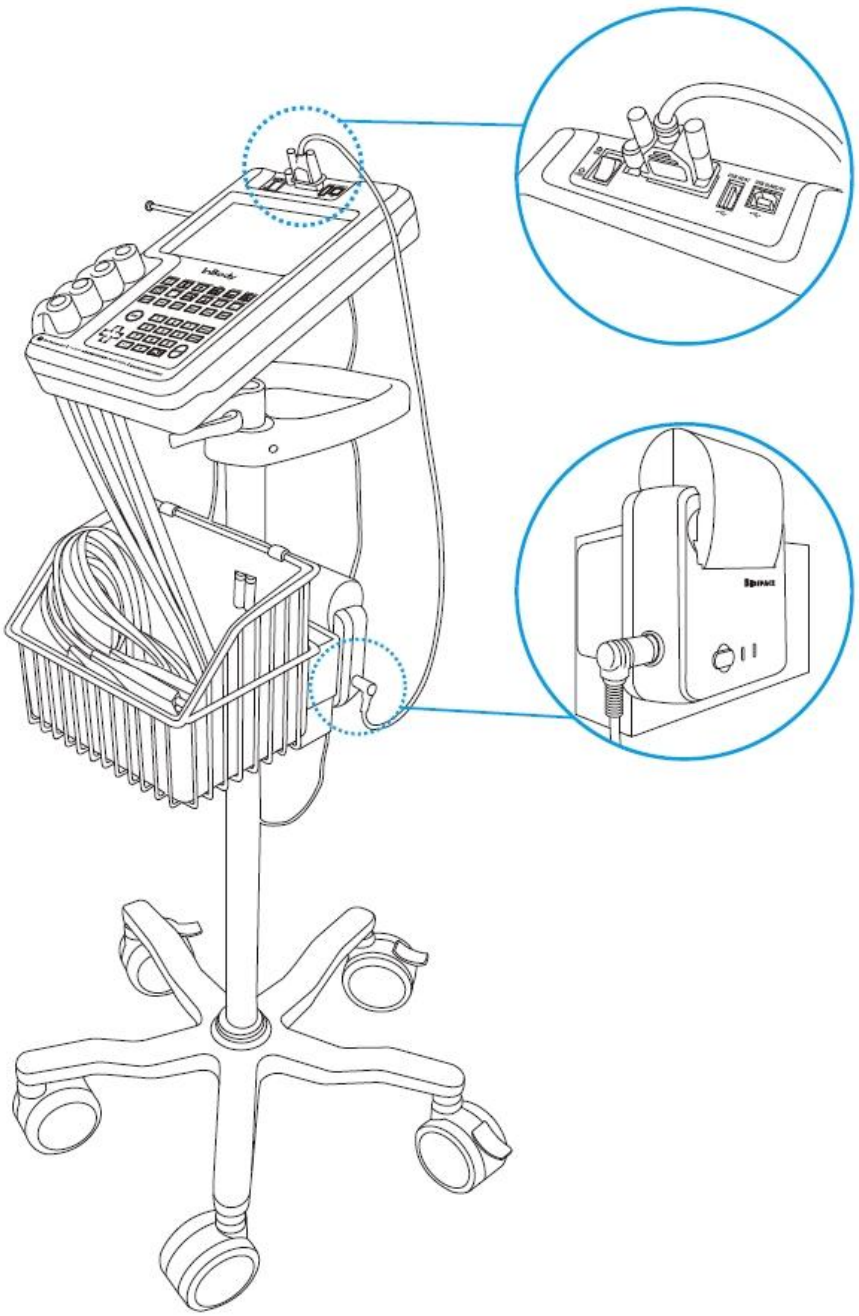
② Adjust the position of thermal printer's rear side to the separated supporting metal plate. Fasten 4 screws to fix them together.



③ Fix the thermal printer onto the cart again.



④ Thermal printer cables are connected in the same manner as shown in the picture.



4. Transportation

If it must be transported, be extra careful to ensure safe handling. The following are some tips for safely transporting the InBody S10.

(1) Before transporting the InBody S10, turn off the power switch and unplug the adapter.
(2) Be careful not to damage the hand module.
(3) Be careful not to damage the electric cables.

A. Environmental Requirements

Storage environment : -20 ~ 60℃(-4˚F ~ 140˚F), 10 ~ 95%RH,
50 ~ 106kPa (No condensation)

B. Transporting Before Installation

Before installation, the InBody S10 is shipped in the box designed by Biospace.

Severe physical impact can cause the damage. Be careful not to drop or shake.

C. Transporting After Installation

To prevent physical shock, use Biospace's packing material when shipping or transporting the equipment.

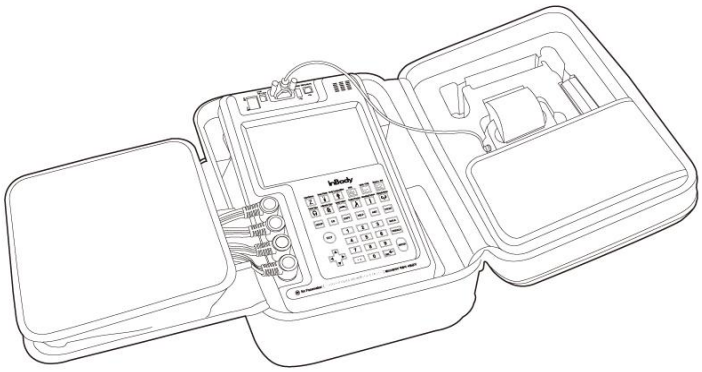
5. Repacking

Be sure to turn off the power switch and unplug the power cable before repacking. Be careful to avoid severe physical shock, jarring or other damage while repacking, especially with regard to the electrode cable and touch type hand/foot electrodes.

(1) Turn off the power switch.

(2) Remove all cables connected to the InBody S10.

(3) Put the separated units in the provided portable bag.



(4) You can carry the machine simply with the portable bag.

6. Maintenance

(1) Do not pull electrode cable by force. Treat it with care.

(2) Take care not to drop electrode cable to the floor, nor drag it on the ground.

(3) Do not impose severe shock or force to the machine.

(4) When the InBody S10 is not in use for a period longer than one day, unplug the adapter.

(5) In case of moving the equipment with the power on, take care not to make physical impact on the equipment.

(6) Do not spill drinks or food into the equipment through radiation hole or cable storage. Substance getting into the equipment will cause a critical damage on the equipment.

(7) Once a week, wipe the exterior sides of the InBody S10 with a dry towel. In particular, clean the LCD monitor, using gentle care not to scratch the surface.

(8) Follow local governing ordinances and recycling plans regarding the disposal or recycling of device components.

Chapter 2. Management & Results Description

1. Cautions Before Measurement
2. Exterior and Functions of Keypad
3. Measurement Posture
4. Connecting the electrodes
5. Power Connection & Getting Started
6. Home Screen
7. Measurement condition settings
8. Personal Profile
9. How to Operate the Equipment
10. Results

1. Cautions Before Measurement

To observe changes of the human body through body composition analysis, it is crucial to perform the analysis each time under the same conditions, temperature, posture, etc. Bear in mind, the following factors affect the results of body composition analysis, and as a result, affect the reproducibility of analysis.

(1) Make sure not to use this equipment with those that have medical electrical devices, such as a pacemaker.

(2) Do not eat before measurement.

(3) Do not exercise or perform any physical activities before testing. If a examinee has already been physically active, a temporary change in body composition will result.

(4) Do not take a bath or shower prior to measurement.

(5) Perform the measurement after urination or excretion, if possible. Residues inside the human body are interpreted as fat mass. Waste in the body means the analysis will be less accurate.

(6) Measurement should ideally be done before mid-day.

(7) Perform the measurement under normal temperature conditions 20~25 °C(68~77 °F). If the ambient temperature is too high or too low, the human body responds, resulting in temporary changes in body composition.

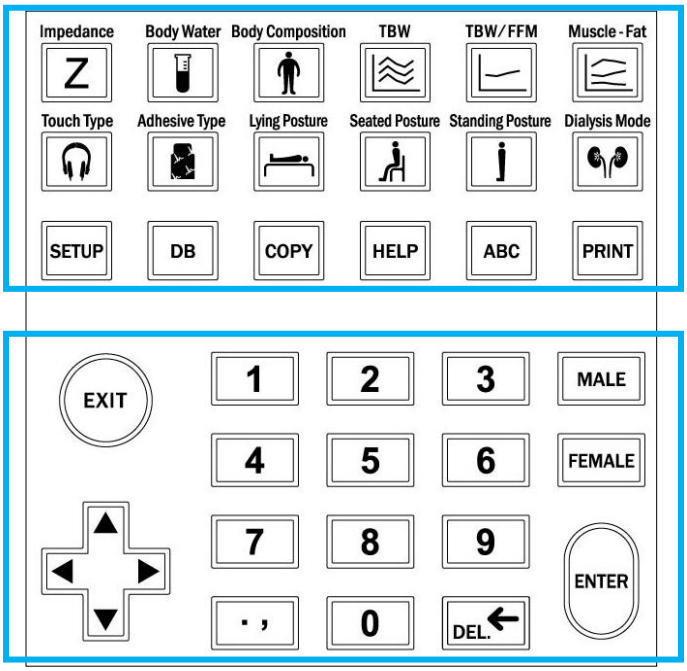
(8) It's important to maintain examinee's posture for 10-15 minutes so that impedance can be measured accurately.

(9) Measuring on a wet bed may affect the results.

(10) Please make sure the examinee's body has no contact with a conductor when testing his or her body.

2. Exterior and Functions of Keypad

The InBody S10 has a keypad for data input. To input all information, press the relevant buttons on the keypad.
Keypad is located below the LCD Monitor. It can be distinguished into 2 categories by their functions.



A. Function Button

B. Input Button

A. Function Button

(1) Check test result

① Impedance Z button

You can check the impedance analysis result.

② Body Water button

You can check body water analysis result.

③ Body Composition button

You can check body composition analysis result.

④

button

You can check accumulated analysis results of ICE(Intracellular water), ECW(extracellular water) and TBW(total body water).

⑤

button

You can check accumulated analysis results of TBW/FFM(Ratio of total body water in fat free mass).

⑥

button

You can check accumulated analysis results of weight-muscle mass-percent body fat

(2) Select electrodes connection type

①

button

Use when using Touch Type electrodes.

②

button

Use when using Adhesive EKG electrodes.

(3) Select posture

①

button

Set for examinees who are lying down.

②

button

Set for examinees who are sitting down.

③

button

Set for examinees who are standing up.

④

button

If examinees are examinees receiving kidney dialysis, make sure to set the equipment to Dialysis Mode.
At I.D. input step, check the measurement time (before/during/after dialysis), access position, and examinee's paralysis location. The information will be stored in the equipment and can be viewed categorically by before/during/after dialysis in the history graph.

(4) Others

①

button

Use the SETUP button when setting up the InBody S10.

②

button

This DB button is to check, delete, print, and copy the results as well as copy them with USB storage device.

③

button

The COPY button will copy all data from the equipment to a USB storage device. Insert the USB storage device into the InBody S10 and press the Copy button. Do not remove the USB storage device before the printing is complete.

④

button

It provides guidelines.

⑤

button

Press the ABC button when entering I.D. information into the InBody S10. A keyboard will appear on the screen.

⑥

button

Use the PRINT button to print the results of the last person who did the test. This button is also used when printing the results shown on the screen.

B. Input Button

①

button

EXIT button is use to stop the process that is in progress or go back to the previous process.

②
button

The directional buttons consist of up, down, left and right.

③ Numerical Buttons (0~9)
The input buttons are use to enter alpha-numeric data such as the examinee's age, height and I.D..

④
button

This button is use to enter a decimal point or comma for height, age, I.D., and weight.

⑤

button

Use to delete entered data.

⑥

It is use for gender input when entering personal profile.

⑦

button

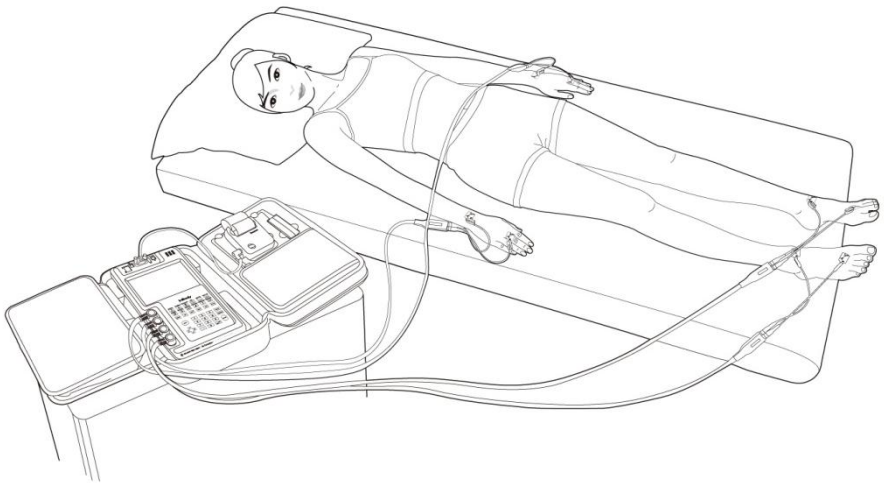
This button is use when data input is finished or to move on to the next item.

3. Measurement Posture

Maintaining the right posture during the test is essential to achieve reliable results and accuracy. It's important to maintain examinee's posture for 10-15 minutes so that impedance can be measured accurately.

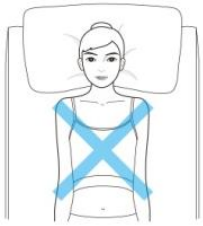
A. Lying Posture

(1) It is recommended that the examinee lying posture for about 10~15 minutes before the test, so that body water may be dispersed evenly inside the body.
(2) Make sure arms do not touch the trunk part of body. Spread them naturally to a 15 degree angle away from trunk.
(3) Make sure thighs do not touch each other, and spread legs to shoulder width.



Attention

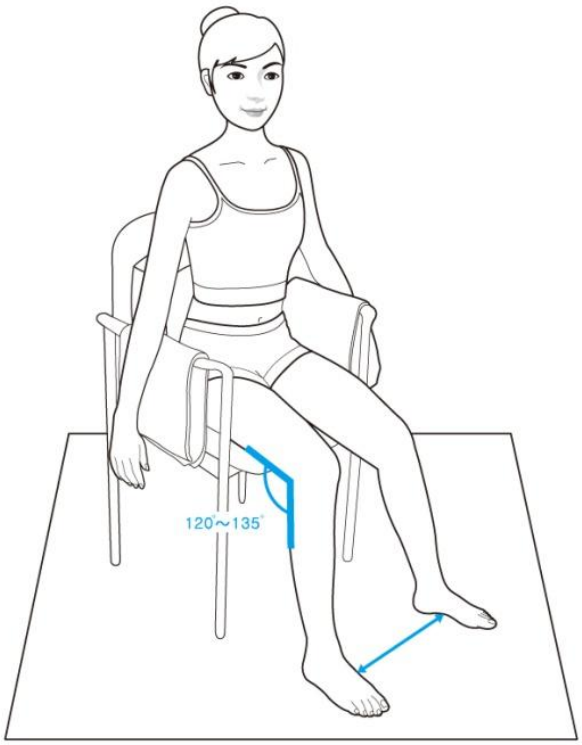
- It is recommended that the examinee lying posture for about 10~15 minutes.
- Make sure arms do not touch the trunk part of body. Spread them naturally to a 15 degree angle away from trunk.
- Make sure thighs do not touch each other, and spread legs to shoulder width.
- Make sure arms do not touch the trunk part of body.



Make sure arms do not touch the trunk part of body.
Make sure thighs do not touch each other.

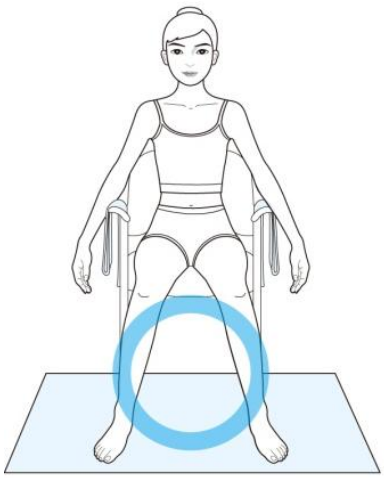
B. Seated Posture

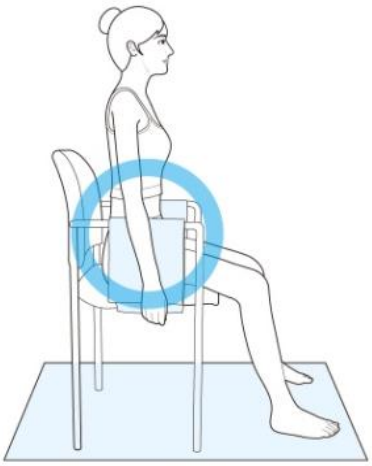
(1) It is recommended that the examinee lying posture for about 10~15 minutes before the test, so that body water may be dispersed evenly inside the body.
(2) Make sure that back is not touching the chair. Straighten back.
(3) Use a cushion to support back.
(4) Arms should be posed lowered naturally as in standing posture. Spread them 15 degrees away from trunk part of body.
(5) Make sure that thighs do not touch each other, and spread them to shoulder width.
(6) Spread legs to the front and do not maintain a 90 degree angle.



Attention

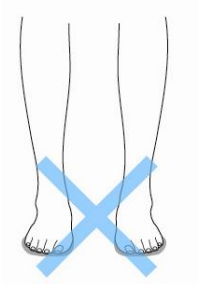
- Make sure that the examinee maintains a straight sitting position during the test.
- It is recommended that the examinee seated posture for about 10~15 minutes.
- If the chair is made of iron, make sure that the examinee's body is not in direct contact with the iron part of the chair. Use a blanket to cover up the iron part of the chair.
- Make sure that the examinee's bare feet are not in direct contact with the iron part of the chair or the floor.
- Due to the weight of the cable, the EKG electrode might fall off when you try to attach it to the examinee's body. Make sure that the EKG electrodes are attached securely to your examinee's body.
- Spread legs to the front; do not maintain a 90 degree angle. If examinee is measuring with bare feet, make sure bare feet do not touch the floor, putting a mat that does not conduct electricity.



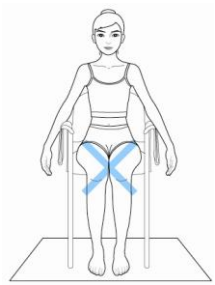


The examinee should not rest his/her arm on the armrest of the chair.

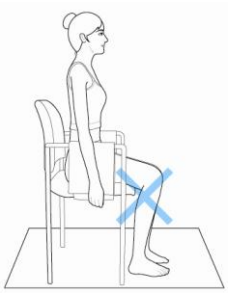
The examinee should not slouch.



Make sure bare feet do not touch the floor.
Use a mat that does not conduct electricity.



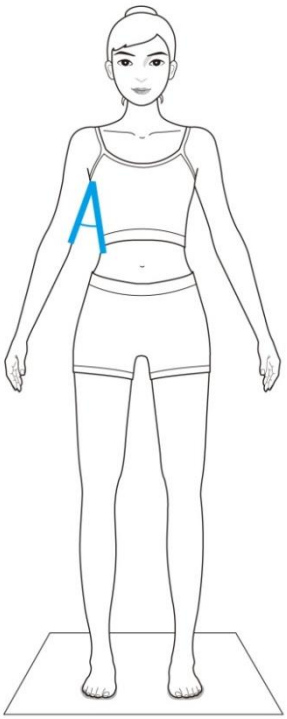
Make sure thighs do not touch each other.



Do not position the examinee’s legs at a 90 degree angle, but stretch them slightly to the front.

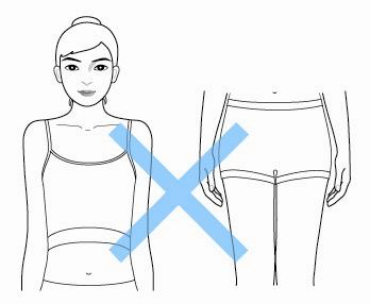
C. Standing Posture

(1) It is recommended that the examinee standing posture for about 10~15 minutes before the test, so that body water may be dispersed evenly inside the body.
(2) Make sure bare feet do not touch the floor. Use a mat that does not conduct electricity.
(3) Make sure arms do not touch the trunk part of body. Spread them naturally to a 15 degree angle away from trunk.
(4) Arms should be posed lowered naturally.
(5) Make sure thighs do not touch each other, and spread legs to shoulder width.

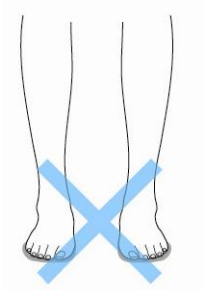


Attention

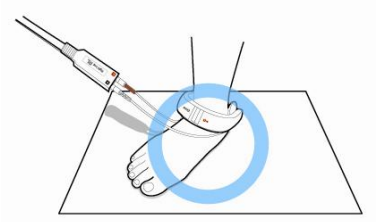
- It is recommended that the examinee standing posture for about 10~15 minutes.
- Make sure bare feet do not touch the floor. Use a mat that does not conduct electricity.
- Hang the electrode cables to not let them dragging on the floor.
- For a examinee with curvy feet the foot electrodes might not attach properly when using the Touch Type electrodes. Make sure to attach it as best as possible.
- If examinees have dry hands and feet, wipe the equipment with an electrolyte tissue before test.
- Due to the weight of the cable, it is easy for the Adhesive Type electrodes to fall off during the test. Please be careful and make sure that the electrodes are attached properly.

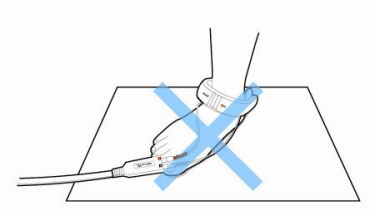


Make sure arms and legs do not touch each other and arms do not touch the trunk part of body.



Make sure bare feet do not touch the floor.
Use a mat that does not conduct electricity.





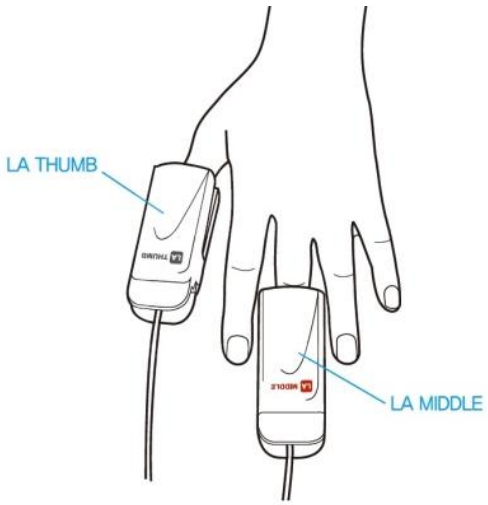
When connecting the electrodes, make sure the electrode cables are not touching the floor. Place them or hang them on a cart or another object.

4. Connecting the electrodes

InBody S10 offers two types of electrodes, the Touch Type electrode and the Adhesive Type electrode.
Check the RA, LA, RL, LL. (RA: Right Arm, LA: Left Arm, RL: Right Leg, LL: Left Leg)
Check on the electrodes parts that will come into contact with examinee's hands and feet.

A. Touch Type

(1) Hand electrodes
LA: connect to Left Arm. RA: connect to Right Arm.
The hand electrodes are marked THUMB for the thumb and MIDDLE for the middle finger.

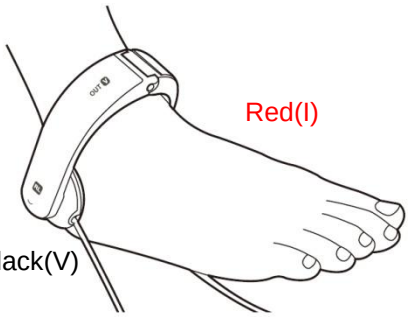


(2) Foot electrodes

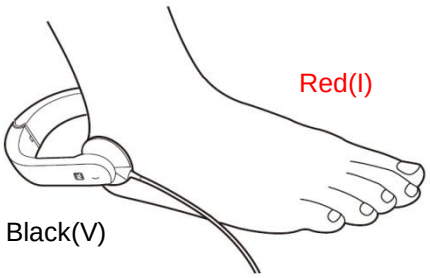
LL: connect to Left Leg. RL: connect to Right Leg.

The foot electrodes should be positioned between examinee's anklebone and heel. Try to have the electrodes in contact with as much area as possible. The part marked in red should be positioned on the inner ankle.

If the examinee's ankles are too thick to put from top side of the foot, place it to the heel.



<When electrodes are attached to top of feet >



<When electrode are attached to the heel>

Attention

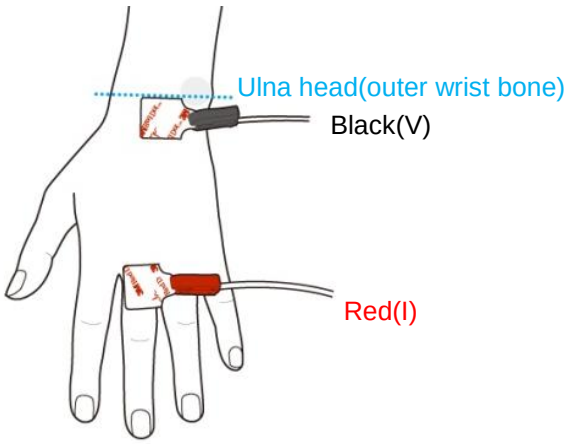
- If the examinee's ankles are too thick to put from top side of the foot, place it to the heel.
- Make sure that the part labeled (I) should come to the inner side of the feet.
- For a examinee with curvy feet the foot electrodes might not attach properly when using the Touch Type electrodes. Make sure to attach it as best as possible.
- The test might not work properly or the results might be inaccurate if the examinee has dry hands/feet. Wipe examinee's hands and feet with an electrolyte tissue before test.

B. Adhesive Type

Attach the EKG electrodes to examinee's hands and feet as below.
And then connect adhesive electrodes to the EKG electrode like the illustration.

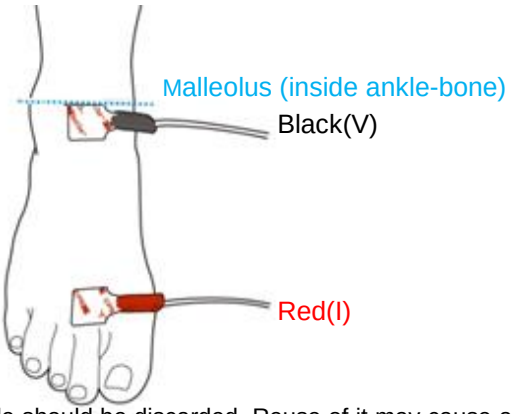
(1) Hand electrodes

Find the ulna head(outer wrist bone) by feeling the joint of the wrist. Imagine or draw a line bisecting the ulna head, perpendicular to the arm. Place the electrode on this line(on the hand side), with the tab of the electrode pointing away from the body. The other electrode should be wrapped around the middle finger, with the tab facing away from the body.



(2) Foot electrodes

The medial malleolus (inside ankle-bone) should be used in the same manner as the ulna head to place the foot's electrode. The foot's other electrode should be placed at the base of the second toe.



NOTE

Once used, the EKG electrode should be discarded. Reuse of it may cause a contamination through indirect physical contact.

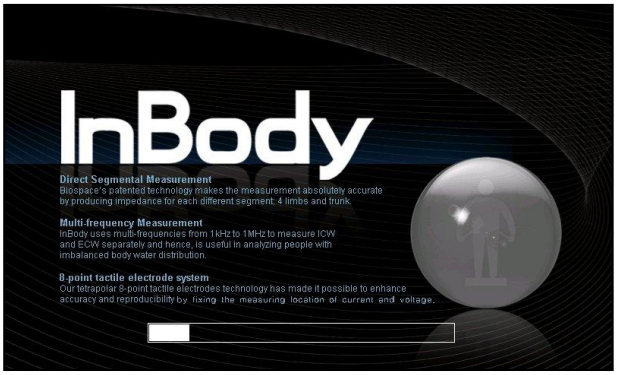
NOTE

As EKG electrode will be in direct contact with the body of the examinee, use only the product with CE certification. We officially recommend 2330 Red Dot Resting Electrode-Tab Style of 3M for the InBody S10.

5. Power Connection & Getting Started

(1) Connect the adapter cable to the power input port.

(2) When system switch is turned on, the screen is displayed as illustrated below and starts warming up by itself.


InBody
Direct Segmental Measurement
Biospace's patented technology makes the measurement absolutely accurate by producing impedance for each different segment: 4 limbs and trunk.
Multi-frequency Measurement
InBody uses multi-frequencies from 1KHz to 1MHz to measure ICW and ECW separately and hence, is useful in analyzing people with imbalanced body water distribution.
8-point tactile electrode system
Our tetrapolar 8-point tactile electrodes technology has made it possible to enhance accuracy and reproducibility by fixing the measuring location of current and voltage.

(3) During the warm up, the InBody S10 processes the self-testing and adjustment of the internal circuit.

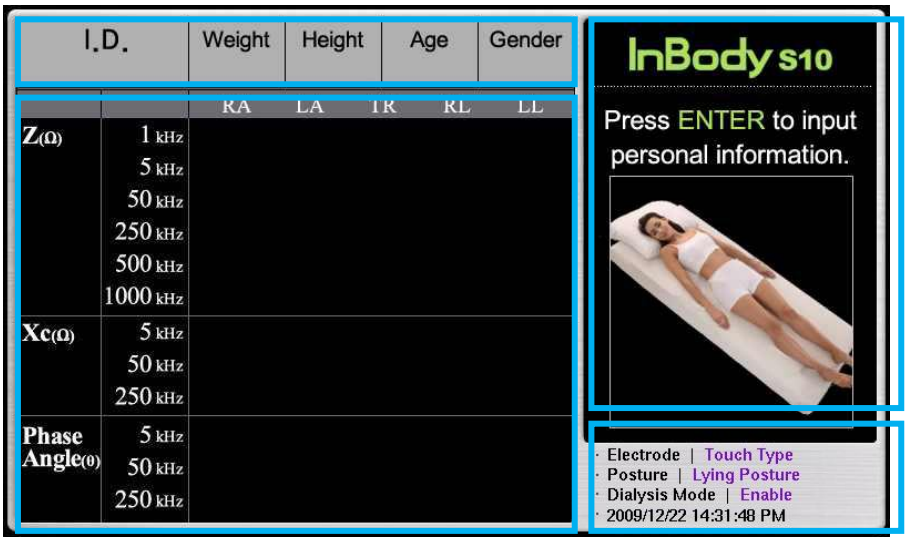
WARNING

When connecting peripherals (printers and other optional devices) to the InBody S10, turn on the power of peripherals before turning on the InBody S10. When turning the power off, turn off the InBody S10 first before turning off the peripherals. This process will minimize harm to the equipment caused by electric shock.

6. Home Screen

InBody S10 has a touch screen function for data input. Press the buttons on the LCD screen or use the keypad buttons to enter information.

The home screen of the InBody S10 has numerous options for both the user's and the examinee's convenience.



(1) Personal Information Screen
This is for I.D., weight , height , age and gender.

(2) Information Screen
This screen displays help, status, and error messages for each step.

(3) Analysis Result Screen
Before printing out the results, you can check the key figures on the screen. All figures shown in the screen are printed on the results sheet.

(4) State Screen
This screen displays the electrode type, posture type, dialysis mode, testing date, and testing time.

WARNING Please do not poke the touch screen with sharp objects. This could cause damage to the touch screen.

7. Measurement condition settings

A. Select electrodes type

Select which electrode you want to use. You can choose either Touch Type or Adhesive Type.

①

button

Use when using Touch Type electrodes.

②

button

Use when using adhesive EKG electrodes.

B. Select measurement posture

You can choose from three different postures: lying down, sitting down, and standing up. Please select the keypad button according to the posture that you want the examinee to be tested

①

button

Set for examinees who are lying down.

②

button

Set for examinees who are sitting down.

③

button

Set for examinees who are standing up.

C. Select dialysis mode

If examinees are examinees receiving kidney dialysis, make sure to set the equipment to Dialysis Mode.

At I.D. input step, check the measurement time (before/during/after dialysis), access position, and your paralysis location.

To use the Dialysis Mode, press the ‘Dialysis Mode’ button and enable the feature. If not, disable the feature.

8. Personal Profile

Weight and height are essential information for body composition analysis, and for more comprehension, age and gender are used to provide standard range. The InBody S10 analyzes the measurement results based on the input data. To reduce errors and acquire more reliable results, input examinee data after reading the following carefully.

I.D.	Weight	Height	Age	Gender

(1) I.D. (Permitted range: 14 Characters)
You can use the number buttons on the keypad when inputting numbers. If you are entering letters, press the ABC button on the keypad. When you press the ABC button, LCD screen will turn to both letters and numbers.

(2) Weight (Recommended input range: 10kg ~ 250kg)
Use the keypad to enter weight.

(3) Height (Recommended input range: 95cm ~ 220cm, 3ft. 1.4in. ~ 7ft. 2.6in.)
Use the keypad to enter height. Height can have one digit under the decimal point.

(4) Age (Recommended input range: 3~99 years)
Use the keypad to enter age. For optimal accuracy, for examinees under the age of 18, you may include a decimal point when inputting their age.
Example: 13 and 6 months years old = 13 years + 6 months/12 months = 13.5

(5) Gender
You can select the gender by using the Male or Female buttons.

In case of the discovery of typos and misspelled words, you can make changes through the following

1. If you find an error, use the left/right button to move to the incorrect item.
   Use the DEL. button to delete the data, and enter in the correct information.
2. If you press the EXIT button during the InBody S10 test, you can reenter your data.
   If you press EXIT button one more time, you will be transferred to the home screen.

9. How to Operate the Equipment

(1) Please select electrodes type. (Touch Type, Adhesive Type)

(2) Please select a examinee's posture type.
(Lying Posture, Seated Posture, Standing Posture)

(3) Please select whether you will be using the 'Dialysis Mode' or not. (Enable, Disable)
If examinees are examinees receiving kidney dialysis, make sure to set the equipment to 'Dialysis Mode'. Check the measurement time (before/during/after dialysis), access position, and paralysis location.

(4) Before test, the examinee must maintain his/her posture for more than10-15 minutes in order to reposition his/her body water level.

(5) Please refer to Chapter 4. Connecting the electrodes guidelines and attach the electrodes to the examinee's hands and feet.

(6) Input I.D., weight, height, age, and gender.

NOTE

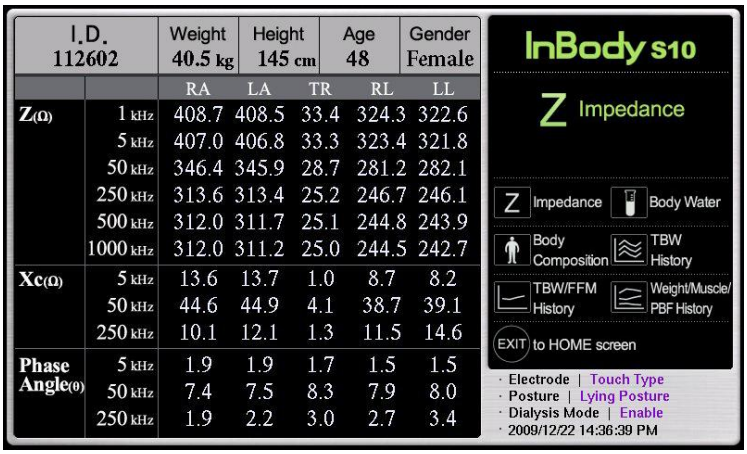
If you enter the information that is out of the range, the above error will appear on the screen. Please reenter the personal information.

(7) Check that the electrodes are attached securely and press the 'Enter' button. If you did not attach the electrodes to the examinee's body, please do so now. After attaching the electrodes, please check again to ensure that the examinee's posture is correct and that the electrodes are connected securely. Afterwards, press the 'Enter' button to start the test. Please make sure that the examinee maintains his/her position during the test.

(8) During the test, the LCD information screen will display the testing status and the analysis results screen will display impedance, reactance and phase angles. If you want to modify the examinee's personal information during the test, please press the EXIT button. Move to the item you want to modify by using the direction button. After modifying the information, press the ENTER button to start the test again.

(9) After the test is completed, a "Test Complete" message will appear on the information screen. If you entered the examinee's I.D. for the test, the InBody S10 will automatically save all results in the system. If the printer is connected and there are results sheets in the printer, the printer will automatically print the results on the results sheet.

(10) After the measurement process is completed, the impedance results will appear on the screen. Help section of the information screen will advice what item you should choose to check certain result. You can check the results as well as the cumulate results on the LCD screen. Press the 'Exit' button to close the results screen and return to the home screen.

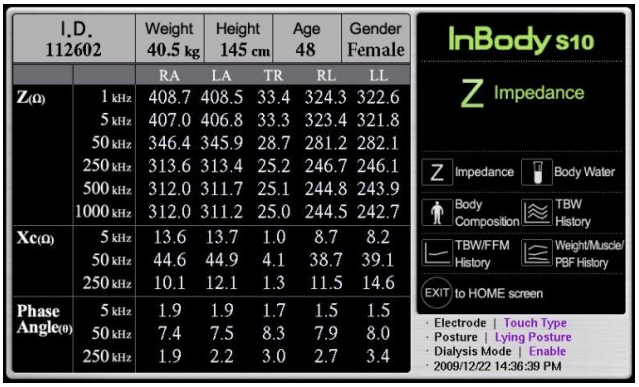


10. Results

A. **Result Screen**

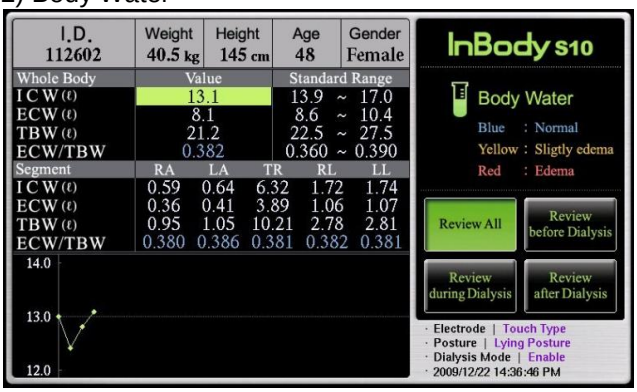
You can check the impedance results first. If you want to check other results such as body water level, body composition, cumulative body water level, cumulative TBW/FFM, and cumulative weight/muscle/percent fat, press the relevant keypad button. Please refer to the help section of the information screen.

1) Impedance(Z)/ Reactance(Xc)/ Phase angle(θ)



		RA	LA	TR	RL	LL
Z(Ω)	1 kHz	408.7	408.5	33.4	324.3	322.6
	5 kHz	407.0	406.8	33.3	323.4	321.8
	50 kHz	346.4	345.9	28.7	281.2	282.1
	250 kHz	313.6	313.4	25.2	246.7	246.1
	500 kHz	312.0	311.7	25.1	244.8	243.9
	1000 kHz	312.0	311.2	25.0	244.5	242.7
Xc(Ω)	5 kHz	13.6	13.7	1.0	8.7	8.2
	50 kHz	44.6	44.9	4.1	38.7	39.1
	250 kHz	10.1	12.1	1.3	11.5	14.6
Phase Angle(°)	5 kHz	1.9	1.9	1.7	1.5	1.5
	50 kHz	7.4	7.5	8.3	7.9	8.0
	250 kHz	1.9	2.2	3.0	2.7	3.4

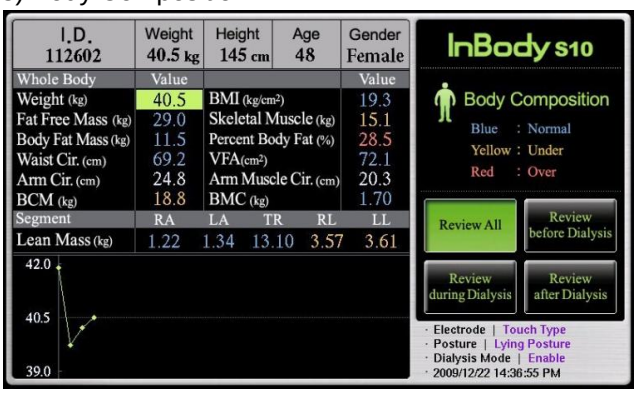
2) Body Water



Whole Body	Value	Standard Range
ICW(ℓ)	13.1	13.9 ~ 17.0
ECW(ℓ)	8.1	8.6 ~ 10.4
TBW(ℓ)	21.2	22.5 ~ 27.5
ECW/TBW	0.382	0.360 ~ 0.390

Segment	RA	LA	TR	RL	LL
ICW(ℓ)	0.59	0.64	6.32	1.72	1.74
ECW(ℓ)	0.36	0.41	3.89	1.06	1.07
TBW(ℓ)	0.95	1.05	10.21	2.78	2.81
ECW/TBW	0.380	0.386	0.381	0.382	0.381

3) Body Composition



Whole Body	Value		Value
Weight (kg)	40.5	BMI (kg/cm²)	19.3
Fat Free Mass (kg)	29.0	Skeletal Muscle (kg)	15.1
Body Fat Mass (kg)	11.5	Percent Body Fat (%)	28.5
Waist Cir. (cm)	69.2	VFA(cm²)	72.1
Arm Cir. (cm)	24.8	Arm Muscle Cir. (cm)	20.3
BCM (kg)	18.8	BMC (kg)	1.70

Segment	RA	LA	TR	RL	LL
Lean Mass (kg)	1.22	1.34	13.10	3.57	3.61

4) ICW, ICW, ECW History

5) TBW/FFM History

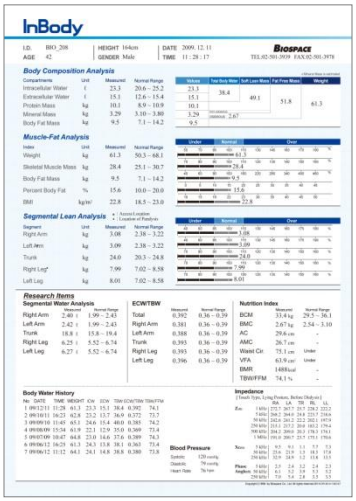
6) Weight/ Muscle/PBF History

B. Results Sheet Form

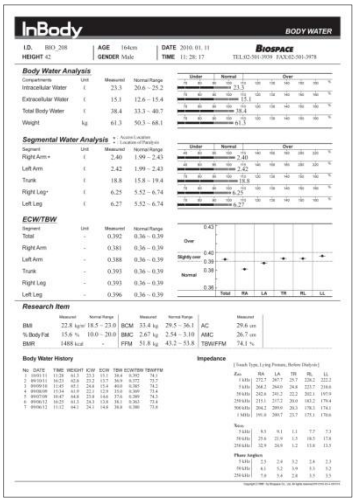
If the printer is connected, you can print the results sheet. You can also use the results sheet to access more detailed information.

(1) Printer Connection
Use the printers recommended by Biospace.

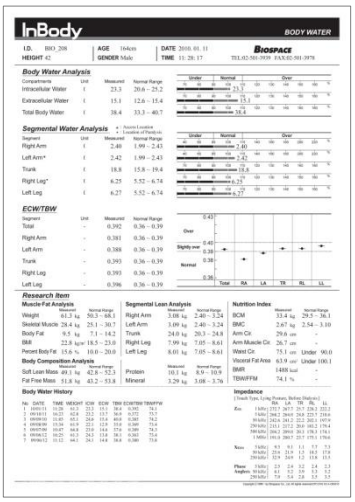
(2) Results Sheet Type
The results sheet is consumable. Use A4 standard size paper or the printed results sheet which Biospace provides. Please contact Biospace or an authorized distributor to place the purchase order.



<Body Composition Results Sheet>



<Water Results Sheet I>



< Water Results Sheet Ⅱ>

C. Output Items

The following are the definitions and explanation for each item analyzed on the results sheet.

(1) Personal Information
The examinee's I.D., age, height gender, exam date and time are displayed here.

I.D.	BIO_208	HEIGHT	164cm	DATE	2009. 12. 11	BIOSPACE	
AGE	42	GENDER	Male	TIME	11 : 28 : 17	TEL:02-501-3939	FAX:02-501-3978

(2) User Information
According to the user's purpose, the name of the hospital or clinic, address, contact number and the doctor in charge can be displayed here.

If you want to create or modify user information, contact Biospace or distributor.

(3) Body Composition Analysis
The InBody S10 assigns a quantitative value to the select elements of the body's composition. These values demonstrate the weight of each compositional element which comprises the examinee's total body weight.

Body Composition Analysis

Compartments	Unit	Measured	Normal Range
Intracellular Water	ℓ	23.3	20.6 ~ 25.2
Extracellular Water	ℓ	15.1	12.6 ~ 15.4
Protein Mass	kg	10.1	8.9 ~ 10.9
Mineral Mass	kg	3.29	3.10 ~ 3.80
Body Fat Mass	kg	9.5	7.1 ~ 14.2

※Mineral Mass is estimated.

Values	Total Body Water	Soft Lean Mass	Fat Free Mass	Weight
23.3	38.4	49.1	51.8	61.3
15.1				
10.1				
3.29	non-osseous osseous : 2.67			
9.5				

The body composition analysis of InBody S10 is derived from the 4-compartment model, which divides body composition into 4 components comprising Total Body Water, Protein, Mineral and Body Fat. Your own data are displayed here. Total body weight is the sum of Body Fat and Fat Free Mass (FFM). FFM is the sum of Mineral and Soft Lean Mass (SLM). SLM is the sum of Protein and Total Body Water consisting of Intracellular Water (ICW) and Extracellular Water (ECW), which are separated by cell membranes .'Normal Range' means standard value range when your body has ideal body composition for your own height.

①Intracellular Water (ℓ) : The water inside each cell

②Extracellular Water (ℓ) : The water outside each cell

③Protein Mass (kg)
The mass of protein. Protein is a major component of limb muscle, intestinal muscle, and skin.

④Mineral Mass (kg)
Mineral Mass cannot be obtained with BIA methodology, but InBody S10 offers the estimated value of mineral mass because bone mineral mass is closely correlated with FFM. The correctness of this estimated value has been validated by comparison with the DEXA method. Thus, mineral mass could be used for screening the examinees who have risk factors of osteoporosis.

⑤Body Fat Mass (kg)
The sum of subcutaneous fat, visceral fat, and intramuscular fat.

⑥Total Body Water (ℓ)
The total volume of water in the body. The sum of the intracellular and the extracellular water.
It is shown as "ℓ" on the results sheet. However, mass measured in kilograms (kg) is the basic unit of measure for body composition components. Therefore, the unit volume of water should be converted to a mass unit. It is a common known fact that the volume of 1 liter (ℓ) is equal to the mass of 1kg in water. This fact allows volume and mass to be interchangeable i.e. used at the same time.

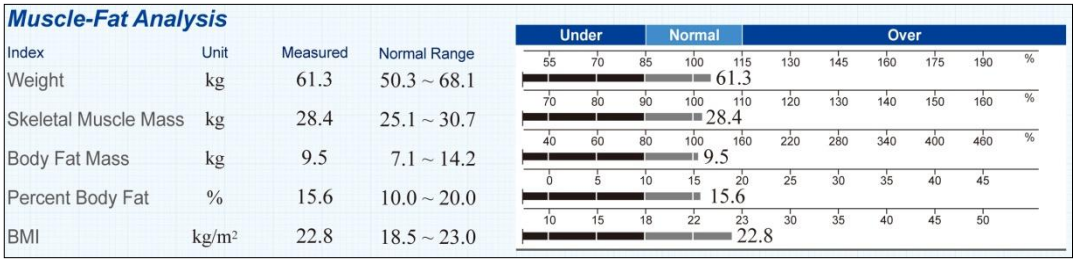
⑦Soft Lean Mass (kg)
The ideal weight is calculated based on examinee's height. A examinee's soft lean mass can be estimated using average weight and average percent body fat. Problems occur only when the soft lean mass is less than the average, however, no difficulties are encountered when soft lean mass is greater than average.

⑧Fat Free Mass (kg) : The sum of soft lean mass and the mineral mass.

⑨Weight (kg)

(4) Muscle-Fat Analysis

Bar graphs and values are displayed here. The length of the bar graph is the relative percentage based on the standard amount (100%). The values at the end of each bar are the measured values. Especially, because body fat is more various among people than muscle mass, each bar has different scale. The value next to bar shows you the measured values and the end of bar indicates your position in the range. If the length of the bars would be similar, your body composition is well balanced, while if the lengths of the bars fluctuate, it means your body composition is not balanced.



① Weight (kg)

Generally, BMI 18.5~25 is used for determining normal range of weight. But in InBody S10, normal range for weight is standard weight ±15% of standard value, and the range is very similar to the one based on BMI (18.5~25). Standard weight is determined according to BMI 22 for males, BMI 21 for asian females, BMI 21.5 for western females, and growth chart for the age under 18.

Formula to get ideal weight	
Male	Female
Ideal Weight = Height^2(㎡) × 22	Ideal Weight = Height^2(㎡) × 21 (asian) Ideal Weight = Height^2(㎡) × 21.5 (western)

② Skeletal Muscle Mass (kg)

Skeletal muscle mass is computed based on muscle mass of the limbs, which is almost composed of skeletal muscle and takes up about 70% of total body skeletal muscle.

③ Body Fat Mass(kg)

100% of the body fat mass means the examinee is in the ideal weight and the normal percent body fat. Compared with muscle mass, body fat mass is various among people. The

horizontal bar graph helps you understand your body composition state compared to standard values. Especially, because body fat is more various among people than muscle mass, those two bars have different scale.

④Percent Body Fat (%)

Percent Body Fat indicates the percentage of body fat to body weight. The standard Percent Body Fat is 15% for men and 23% for women, while the standard range of body fat mass for men is 10-20% of the standard weight, and 18-28% of the standard weight for women. In the case of children under the age of 18, children's standard is used.

Ref.
Semuel J. Fomon, et al.(1982): Body Composition of reference children form birth to age 10 years. The American Jounal of Clinical Nutrition: 35, 1169-1175, 1982

⑤ BMI (Body Mass Index, kg/㎡)

Body Mass Index is a convenient way of assessing the degree of obesity. Body composition and Lean Body Mass are not considered. BMI is determined using only the weight and height. The InBody S10 identifies a standard BMI of 22 for males and 21.5 for western females and 21 for asian females.

Formula) BMI = Weight (kg) ÷ Height^2 (㎡)

Determination 1) WHO Standard

BMI(kg/㎡)	Classification		Diagnosis
<18.5	Underweight	Under	Infectious disease, malnutrition related disease
18.5~24.9	Normal	Standard	Least risk at most disease
25.0~29.9	Overweight	Over	May cause health problem
30.0~34.9	Obese1		Increase of the risk of cardiac disease, high blood pressure, diabetes, etc
35.0~39.9	Obese2		
>40	Severely Obese		

Ref. WHO and the National Heart, Lung, and Blood Institute : clinical guidelines on the identification, evaluation, and treatment of over weight and obesity in adults, the evidence report. June 1998, xiv

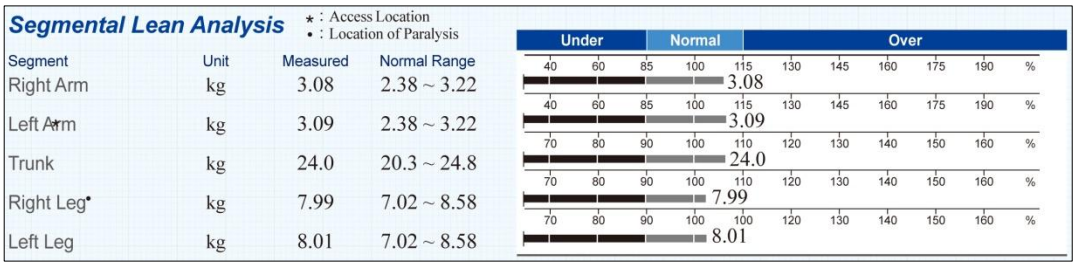
Determination 2) Asian-Pacific Standard

BMI(kg/㎡)	Classification	Risk of associated disease
<18.5	Underweight	Low (high risk of other clinical disease)
18.5~22.9	Normal	Average

>23	Overweight	
23.0~24.9	Risky Overweight	Increased
25.0~29.9	Obese step1	Moderate
>30	Obese step2	Severe

Ref. Korean Society for the Study of Obesity, chapter 2. Redefining and Evaluation, The Asian-Pacific perspective: Redefining Obesity and its Treatment:, 1st edition, Korean Society for the Study of Obesity, 2001, p10.
For children under the age of 18, children s standard is used.

(5) Segmental Lean Analysis



The number next to the bar represents the absolute value for lean body mass of an examinee in kilograms. In the range, 100% actually determines the length of the graph. It represents ideal lean body mass in the ideal weight of the examinee to his or her height.

❶Right Arm (kg) : The value shows the amount of muscles in right arm.
❷Left Arm (kg) : The value shows the amount of muscles in left arm.
❸Trunk (kg) : The value shows the amount of muscles in trunk.
❹Right Leg (kg) : The value shows the amount of muscles in right leg.
❺Left Leg (kg) : The value shows the amount of muscles in left leg.

(6) Research Items

Research Items
Segmental Water Analysis
Measured Normal Range
Right Arm 2.40 ℓ 1.99 ~ 2.43
Left Arm 2.42 ℓ 1.99 ~ 2.43
Trunk 18.8 ℓ 15.8 ~ 19.4
Right Leg 6.25 ℓ 5.52 ~ 6.74
Left Leg 6.27 ℓ 5.52 ~ 6.74
ECW/TBW
Measured Normal Range
Total 0.392 0.36 ~ 0.39
Right Arm 0.381 0.36 ~ 0.39
Left Arm 0.388 0.36 ~ 0.39
Trunk 0.393 0.36 ~ 0.39
Right Leg 0.393 0.36 ~ 0.39
Left Leg 0.396 0.36 ~ 0.39
Nutrition Index
Measured Normal Range
BCM 33.4 kg 29.5 ~ 36.1
BMC 2.67 kg 2.54 ~ 3.10
AC 29.6 cm -
AMC 26.7 cm -
Waist Cir. 75.1 cm Under
VFA 63.9 cm² Under
BMR 1488 kcal -
TBW/FFM 74.1 % -

①Segmental Water Analysis(Body Water)
The InBody S10 is available to show the body water of each segmental body part.
Body water is proportionate to soft lean mass.
If soft lean mass has increased due to exercise or other efforts, the body water should have increased as well.

②ECW/TBW
InBody S10 measures intracellular water levels and extracellular water levels separately and makes assessments by finding the balance between the body water levels. The body water ratio(ECW/TBW) presents not only each part of body such as arms, trunk, and legs, but also the whole body.
The healthy person shows maintenance in a certain ratio of the intracellular water level and extracellular water level.
However, if the extracellular water level increases, this can cause an edema. The normal range for ECW/TBW (edema index) is considered 0.36-0.39. The ratio between 0.39 to 0.40 means 'slight edema', and over 0.40 means edema.

Body water ratio (edema index)(ECW/TBW)
= Extracellular water / Total body water

③Nutrition Index
a. BCM(Body Cell Mass)
The body cell mass is the sum of cells that are made up of the intracellular water level and proteins and is one of the methods to evaluate the nutritional staus. For a healthy normal person, we can do a nutrition assessment through a BMI or body fat level. However, a examinee with health problems might have an abnormal increase in the amount of extracellular water due to abdominal dropsy or edema. It leads to inaccurate result of body composition and overestimates fat free mass since the extracellular water has increased.
Therefore, it is appropriate to use the BCM index which does not get influenced by extracellular water level in its analysis to assess nutritional levels.

b. BMC (Bone Mineral Content, kg)

BMC refers to the mineral content inside your bones. The BMC index can be measured through the DEXA (Dual Energy X-ray Absorptiometry). The InBody S10 uses regression analysis to obtain BMC.

c. AC(Arm circumference)
AC refers to the arm circumference of the left arm. AC is used to assess the nutritional state of your protein levels. The diagnosis of examniee's nutritive condition is made by constant monitoring changes in AC, not a one-time measurement.

d. AMC(Arm Muscle Circumference)
AMC refers to circumference of the left arm muscle. An individual's nutritive condition is most quickly reflected in the AMC. This is why dietetics uses the AMC to assess the nutritive conditions of examinees. An individual suffering from malnutrition will have a decrease in AMC over time. Therefore, it is helpful to monitor the AMC over time rather than measuring it just once.

e. Waist Cir.
The waist circumference is measured at the level of your navel and is used as an index for abdominal obesity. In case of westerners, a person is obese if his/her waist circumference is more than 94cm (for males), and more than 80cm (for females). Abdominal obesity indicates an excess of visceral fat and is the cause of diseases such as high blood pressure, cardiovascular disease, and diabetes.

f. VFA(Visceral Fat Area)
VFA refers to the visceral fat area. Body fat is divided into categories depending on the location of the fat: visceral fat, subcutaneous fat, and the fat between your muscles. An individual with a visceral fat area of more than 100cm^2 is considered to be abdominally obese in the visceral fat area.
* Generally, even though infants have a high WHR(Waist Hip Ratio), they have low visceral fat than adults. The reason is because infants have mostly subcutaneous fat. The older we are, the visceral fat area might increase even if WHR remains the same. It is how our body goes when we get older.

g. BMR(Basal Metabolic Rate)
Basal Metabolic Rate (BMR) is the minimal energy requirement for sustaining vital functions at rest. With InBody S10, BMR is estimated by a known regression equation based on FFM. FFM is known to be closely related to BMR.

Ref. John J Cunningham. Body composition as a determinant of energy expenditure : a synthetic review and proposed general prediction equation. Am J Clin Nutr. Vol.54, 963-969,1991.

* Generally, the Harris-Benedict equation is commonly used for BMR. It considers gender,

age, height, and weight to calculate BMR.
However, the direct measurement method bases its numbers on the most active body composition element, body fat, and is considered to be more in line with BMR. In addition, body gas analysis can help obtain more accurate BMR numbers.

h. TBW/FFM
The TBW/FFM ratio is a ratio of the amount of body water in the fat free mass. For a healthy individual, the TBW/FFM should be about 73.3%. The ratio decreases for people suffering from malnutrition, and increases for individuals with diseases.

(7) Body Water History

Body Water History

No	DATE	TIME	WEIGHT	ICW	ECW	TBW	ECW/TBW	TBW/FFM
1	09/12/11	11:28	61.3	23.3	15.1	38.4	0.392	74.1
2	09/10/11	16:23	62.8	23.2	13.7	36.9	0.372	73.7
3	09/09/10	11:45	65.1	24.6	15.4	40.0	0.385	74.2
4	09/08/09	15:34	61.9	22.1	12.9	35.0	0.369	73.4
5	09/07/09	10:47	64.8	23.0	14.6	37.6	0.389	74.3
6	09/06/12	16:25	61.3	24.3	13.8	38.1	0.363	73.4
7	09/06/12	11:12	64.1	24.1	14.8	38.8	0.380	73.8

Body Water History offers up to 12 monitoring data in table enabling to see examniee's recent body water change at a glance. The table shows 6 major body water items such as weight, Intracellular water(ICW), Extracellular water(ECW), Total Body Water(TBW), ECW/TBW and TBW/FFM of each measurement date and time.

(8) Blood Pressure
The sphygmomanometer is linked with the InBodyS10 and available to print systolic blood pressure, diastolic blood pressure, and heart rate.

Blood Pressure

Systolic	120 mmHg
Diastolic	79 mmHg
Heart Rate	76 bpm

Impedance
[Touch Type, Lying Posture, Before Dialysis]

		RA	LA	TR	RL	LL
$Z_{(\Omega)}$	1 kHz	272.7	267.7	25.7	228.2	222.2
	5 kHz	268.2	264.0	24.8	223.7	218.6
	50 kHz	242.6	241.2	22.2	202.1	197.9
	250 kHz	215.1	217.2	20.0	183.2	179.4
	500 kHz	204.2	209.0	20.3	178.3	174.1
	1 MHz	191.0	200.7	23.7	175.1	170.6
$Xc_{(\Omega)}$	5 kHz	9.5	9.1	1.1	7.7	7.3
	50 kHz	25.6	21.9	1.5	18.5	17.8
	250 kHz	32.9	24.9	1.2	13.8	13.5
Phase Angle$_{(\theta)}$	5 kHz	2.5	2.4	3.2	2.4	2.3
	50 kHz	6.1	5.2	3.9	5.3	5.2
	250 kHz	7.0	5.4	2.8	3.5	3.5

(9) Impedance

It shows the impedance values from the measurements at 6 frequencies (1, 5, 50, 250, 500, 1MHz). For further research purpose, from the left to the right, it shows the values for the right arm, left arm, trunk, right leg and

left leg. These data indicate if the measurement is successful or not. The data should decrease vertically. Otherwise, the measurement is wrong or the unit is defective.

Chapter3. Setup Establishment

1. Setup
2. Setup Menu
3. DATABASE

1. Setup

The InBody S10 has a function to modify the setting for the user's preference. The setup menu consists of Settings, Result Sheet Option, Result Output Option, Printer, Interface and Touch Alignment.

Set up menu screen as shown below. If you want to save the change of the set up, press 'ENTER' button.

(1) Press the item you desire to revise out of 6 large categories.
(Settings, Result Sheet Option, Result Output Option, Printer, Interface, Touch Alignment)

(2) Select the item you desire to revise out of middle categories.

(3) Items out of small categories will be listed. For selecting an option, direction button (▲,▼) appears on the right. You can change it using this direction button (▲,▼).

(4) Press the 'ENTER' button after the revision, then the revision will be saved automatically. If the 'ENTER' button is not pressed, the revised content will not be saved. So, be sure to press it.

(5) Press the 'EXIT' button, then the screen will be moved to the home screen.

Please do not poke the touch screen with sharp objects. This could cause damage to the touch screen.

2. SETUP Menu

Items out of small categories will be listed. For selecting an option, direction button (▲,▼) appears on the right. You can change it using this direction button (▲,▼).

A. Settings

(1) Date / Time / Display Mode

- Date : Set the current date.
- Time : Set the current time in the order of OO(hour)/OO(min)/OO(sec)
- Display Mode : Select the date display mode. (YY/MM/DD, MM/DD/YY, DD/MM/YY)

(2) Language / Ethnic Background / Sound Type / Volume

- Language : Select the langauge to be used. (Korean, English)
- Ethnic Background : Select the ethnic background of the examinee. (Asian, Caucasian, African, Hispanic, Others)
- Sound Type : Use beep sound to inform measurement status.(Beep)
- Volume : Use to control sound volume.(0~100%)

(3) Gender Selection / Unit

- Gender Selection
  - ①Female : Without a stage to input the gender, its automatic gender input data is female.
  - ②Male : Without a stage to input the gender, its automatic gender input data is male.
  - ③Last Gender : It sets the most recent examinee's gender data. Examinee can revise it during measurement.

- Unit : Select the unit to be used for height and weight. (kg/cm, kg/in., lb./cm, lb./in.)

B. Result Sheet Option

(1) Body Composition Result Sheet / Water Result Sheet I / Water Result Sheet Ⅱ

・Body Composition Result Sheet

①Enable : Print the body composition results sheet.

②Disable : Do not print the body composition results sheet.

・Water Result Sheet I

①Enable : Print the Water Result Sheet I.

②Disable : Do not print the Water Result Sheet I.

・Water Result Sheet Ⅱ

①Enable : Print the Water Result Sheet Ⅱ.

②Disable : Do not print the Water Result Sheet Ⅱ.

(2) Body Com. Sheet Type / Number of Copies

・Body Com. Sheet Type: Select an option to print results sheet.

①Printed Paper : To use printed results sheet provided by BIOSPACE.

②Blank Paper : To use blank A4 size. All formats of the results sheet will be printed out.

・ Number of Copies : You can decide the numbers of results sheet automatically printed after measurement.

① Manual : When measurement completed, it does not print any results sheet automatically. For result's printing, it should be operated manually in DB screen.

② Auto(1sheet) : When measurement completed, it prints one page of results sheet automatically.

③ Auto(2sheets) : When measurement completed, it prints two pages of results sheet automatically.

(3) Logo Type

・Logo Type : It sets log to use in results sheet.

① Logo Image : Select this when you input logo using other computer connected to InBody S10. User cannot input logo directly. To modify logo, please contact Biospace or the agent you purchased the product.

②Text : Press Click button. "Input Logo" screen appears. You can input up to three logos using letter buttons on LCD. When you press 'Text' button, keypad will be displayed to input the logo. Make logo with english alphabets and arabian numbers.

C. Result Output Option

(1) BMI Standard

・BMI Standard: It sets standard range of BMI printed in a results sheet.

①Asian : The standard range is 18.5~23.0kg/㎡.

②WHO(World Health Organization) : The standard range is 18.5~25.0kg/㎡.

D. Printer

(1) Printer Type

Select the type of printer. Printers that support PCL3 or above and SPL are compatible with the InBody S10. (PCL Compatible, SPL Compatible, SPL 2009 Compatible)

(2) Result Sheet Alignment

It is possible to adjust the coordinates on the results sheet. After adjustment, you can check whether the alignment has done properly by “test print”.

The adjustment range: X (▲,▼), Y (▲,▼) +50~-50)

(3) Test Print

You can check the printing coordinates by printing out a sample. When you press ‘Click’ button, it prints a results sheet in the default printer set for use.

E. Interface

Sets the connection of external device to InBody S10.

(1) Serial Port (COM1)

Select the external device to be connected with 9 pin serial port.

① Disable : Do not use 9 pin serial port.

② Lookin’Body : Select when you use Lookin’Body with 9 pin serial cable.
* It will be supported.

③ Blood Pressure Monitor (From Biospace)
: When you use blood pressure monitor provided by Biospace.

④ Stadiometer (From Biospace)
: When you use stadiometer provided by Biospace.

⑤ Thermal : Select when you use a thermal printer.
⑥ SD400 : Select when you use SD400. You can connect many of the option devices offered by Biospace at once.

(2) USB Slave * It will be supported.
Enable when you use the Lookin'Body program. (Disable, Lookin'Body)

F. Touch Alignment

If a related function does not operate when pressing a part of the touch screen, there is a problem with the input system. Touch Alignment enables the user to solve this problem.
When you run Touch Alignment, InBody S10's power will be turned on/off automatically.

G. Example for Environmental Setup

(1) To adjust sound volume
①Press the SETUP button.
②Touch the Settings button.
③Select Sound Type/Volume at the second from the left. Detailed items of small categories will be displayed.
④Select Volume from the list and adjust the volume using (▲,▼) buttons.
⑤Touch the ENTER button to save automatically.

(2) To input the logo directly from the unit
①Press the SETUP button.
②Touch the Result Sheet Option button.
③When you select Logo Type from the third at the left, you will see 'Text' at the right side.
④When you click 'text', 'Click' button appears. Three logos will be displayed in Input Logo window.
⑤When you touch 'Text1', 'Text2' or 'Text3', Keypad screen will be displayed for logo's input. Make logo with alphabets and numbers.
⑥Touch the ENTER button to save automatically.

3. DATABASE

Press ‘DATABASE’ on the home screen to open database.
Press the DATABASE key on the keypad to bring up the database screen as shown below.
If you input an I.D. of personal information, the data is automatically saved.
Data saved by DATABASE screen are available for search, result view, print, delete, data backup and data recovery. InBody S10 saves maximum 100,000 data.

A. Data Search

In DATABASE screen, all the data saved in the system will be automatically searched. To search specific data, use I.D. and date search.
(1) I.D. search : Touch

button and input numbers or alphabets included in the I.D.

Touch

button. If you press it in blank, then all data saved will be searched.

(2) Date search: When you touch date part, numbers will be turned to white color. Input certain period you want to search for. Input the starting date of search in ‘From’ and last date of search in ‘To’. Touch

to view the search result. If the date is marked in dark gray,

date search is not available.

The default date is the date of the day.

B. DATABASE MENU

You may choose one among print, copy or delete options by pressing appropriate button on the database screen. Select the desired data, and touch the corresponding button.

(1) VIEW : To recheck the past result, choose the data that you would like to see and touch the button. However, if you click on more than one data point, only the results for the data placed on the top will be displayed.

(2) EXIT : It goes back to home screen.

(3) SELECT ALL : It selects or cancels all data.

(4) PRINT : You may print the results sheet the selected data.

(5) DELETE : You may delete the selected data.

(6) COPY : Move the selected data to USB storage device. File is saved in csv/LIB form in 'InBody' file. You may open the result through Excel (csv file).

(7) BACKUP : You may backup all measurement results from InBody S10 to USB storage device.

(8) RESTORE : Connect the USB storage device which was used for backup to InBody S10 and it will save the entire data to back to InBody S10.
Make sure to check before using this function since original data will be deleted.

When saving data on a USB storage device, do not remove the USB storage device or turn the equipment off during the procedure.

When you restore data from a USB storage device, InBody S10's existing database will be replaced by the data in the USB storage device. Please make sure that it is okay to get rid of

the InBody S10's database before using this feature.

NOTE

Please contact BioSpace for information on what USB storage device can be used with InBody S10.

Chapter4. Problems & Solutions

1. Error Messages
2. Troubleshooting
3. Frequently Asked Question (FAQs)

1. Error Messages

The InBody S10 displays the following error messages to warn the user of the problems run into during operations and to guide the users to take steps. The following are the most common error messages and the steps to handle the corresponding errors.

A. “Data entered is outside of accepted range. Please RE-ENTER.”

This message appears when the value for age or height of the examinee is out of the permissible range for these data. Check your entry again. As for the permissible recommended input range of each data, refer to the “Chapter 2, section 8 : Personal Profile.”

B. “Please check electrode connection.”

This message fires up when the posture of the examinee is not appropriate or the examinee’s palms or soles are too dry or have too much hard skin, making it impossible to start the test. Correct the posture of examinee or wipe examinee’s hands and feet with an electrolyte tissue before re-measuring impedance.

2. Troubleshooting

This section lays out the order of steps you have to take in case of malfunction, with the assumption that you have some basic knowledge about how to operate the equipment. If you still have the problem after taking the following steps, contact the local distributor or Biospace.

A. The equipment does not seem to run, even after the power is on.
(In a normal situation, a signal sounds and the LCD is turned on.)

Cause 1 The plug is not pushed all the way into the electrical outlet.

Actuion1 Push the plug all the way into the electrical outlet.

Cause 2 Extension is not turned on (when using a surge protector) or the power does not flow into extension.
Action 2 Check if the power flows into the extension and the electrical outlet where the extension is connected.

Cause 3 When an adapter not provided by Biospace is used.
Action 3 Use the adapter provided by Biospace only.

Cause 4 Adapter is not tightly inserted into the InBody S10.
Action 4 Insert the adapter into the power input port tightly.

B. Impedance is not measured.

Cause 1 When electrodes are not connected.
Action 1 Please make sure electrodes are properly connected.

Cause 2 When examinee's hands and feet are too dry.
Action 2 Electric currents will not flow well if examinee has dry hands and feet. Wipe examinee's hands and feet with an electrolyte tissue before re-measuring impedance.

Cause 3 There are various reasons for errors.
Action 3 There's a chance that the cable wire is disconnected due to various external impacts. Please try again. If it still doesn't work after 1 and 2 are checked, please contact our customer center.

C. The analysis results are unexpected or unusual.

(It is not common to observe unexpected values. All analyzed values should not be outside of pre-determined ranges.)

Cause 1 Examinee's inappropriate posture or electrodes' wrong connection may cause errors.
Action 1 Please make sure the examinee's actual electrodes type/test posture is the same with the setting in the equipment.

Cause 2 When wrong personal information is entered, error happens.

Action2 Check if the personal information is entered appropriately referring to the recommended input range in chapter 2. ‘8. Personal Profile’.

D. The results sheet is not printing from the printer.

(In a normal situation, the results sheet automatically prints out after the measurement.)

Cause 1 Occurs when the printer cable is unplugged.
Action 1 Ensure the cable is connected tightly to the InBody S10. Occasionally this may occur as a result of a bad cable. In this case, you must replace the cable.

Cause 2 Occurs when the paper tray is empty.
Action 2 Check if there is an indicator light or message on the printer. If the tray is empty then refill it with result paper. Be sure to place the paper properly in the tray (proper direction and surface orientation).

Cause 3 Please check your printing setup.
Action 3 Press the SETUP button, and touch the “Result Sheet Options” button. Make sure that the “Number of Copies” is on ‘Auto (1sheet)’ or ‘Auto (2sheets)’.

Cause 4 Check your printer status on the SETUP menu.
Action 4 Press the SETUP button and touch the “Printer” button on the screen. Then touch “Printer Type”. Touch the right arrow and choose Printer Setup.

E. Test result prints look weird.

Cause 1 Did you get test result values not in alignment with the results sheet?
Action 1 Press the SETUP button, and then touch the “Printer” button on the screen. Touch ‘Result Sheet Alignment’ and adjust X and Y axis. X axis adjusts left and right and Y axis adjusts up and down.

Cause 2 Check your “Result Sheet Option” on the SETUP menu.
Action 2-1 Didn’t you print out on printed results sheet having setup as ‘Blank Paper’?
If you choose ‘Blank Paper’, please make sure to use blank A4 paper.
Action 2-2 Did you get only numbers on the results sheet when you used A4 paper?
It is probably set as ‘Printed paper’. Go to SETUP and touch “Result Sheet Option”. Change the setting to ‘Blank Paper’ on the Result Sheet Type setting.

Cause 3 Did you get a results sheet that has printing on the back side of the results sheet?
Action 3 Please make sure that you have inserted the results paper in the right direction to the printer.

Cause 4 Did you get prints that fade away?
Action 4 You don't have enough ink/toner. Please replace your ink/toner a new ink/toner.

A problem arises when the orientations of printing set in the printer doesn't correspond with that of the InBody S10. Refer to the user's manual of the printer to change the orientations of printing in the printer. The orientation of printing set in the InBody S10 is portrait.

As error message, the misprints, and burnt-out fuse are something that technical service representatives can examine in the process of troubleshooting, keep them in a safe spot or keep records of them.

3. Frequently Asked Question (FAQs)

Even if no problems arise from the equipment, users may still have many questions especially regarding clinical procedures. Below are a few of the more common questions with answers. If additional questions or more clarification is desired, please contact us by E-mail. The E-mail address for clinical questions is as follows:
E-mail : info@biospace.co.kr

A. Must socks or stockings be removed from the feet for analysis?

Bare skin contact is essential in the analysis using the BIA method. Socks or stockings may cause a certain amount of distortion in the results. Socks and stocking must be removed to obtain accurate data.

B. What are the circumstances where an analysis cannot be performed?

Examinees who have a pacemaker or other internal electronic medical devices should never use the InBody S10.

C. Is the electrical current applied to a human body through electrodes safe?

Yes. The BIA method uses an electrical current, but is practically harmless. The InBody S10 has acquired the CE and other certifications that assure the safety of the medical equipment.

D. Do accessories (jewelry, watches, rings, etc.) or any other metal objects worn by an examinee affect the analysis?

The ideal condition for the analysis is simply standing with no clothes (naked) and wearing no accessories. However, this may not always be possible. Therefore, we recommend that the examinee remove as many clothing items and accessories that may affect the weight as possible.

E. How often does the examinee perform the analysis?

The body composition changes by inches but continuously according to steady diet, work out, or medical treatment, etc. We recommend you to measure the InBody S10 once every two to four weeks to reliably see the changes.

F. Do I have to use electrolyte tissue? Can I just use wet cloth?

The electrolyte tissue that comes with the InBody S10 is specially designed for optimal testing, as opposed to other wet cloth. Always use the electrolyte tissue for accurate testing.

G. What does the examinee follow for accurate analysis?

For accurate analysis, Biospace recommends the following:

- Measure with an empty stomach.
- Measure 2 hours after a meal or on an empty stomach.
- Measure after urination and excretion.
- Remove heavy clothes or accessories.
- Do not exercise or take a shower before measurement.
- Make sure to maintain measurement posture for 10-15 minutes before measuring.
- Do not measure after abruptly standing up.
- Do not measure while taking a diuretic.
- For females, avoid having measurement during menstrual period as total body water will

be higher than normal.
- Input accurate weight and height.
- Keep room temperature at 20 ~ 25 ℃(68 ~ 77°F).
Warm up yourself for 20 minutes before a test performed in winter.

Chapter5. Consumables

1. Consumables
2. Options

1. Consumables

A. Results Sheet

When using the InBody S10 with a printer, it is strongly recommended to use the results sheet supplied by Biospace. If more results sheet are needed, please contact Biospace.

Results sheet size	210mm * 297mm (A4 type)
Number of sheets	500 / 1box
Printed condition	4 colors
Manufacturer	Biospace Co., Ltd

2. Options

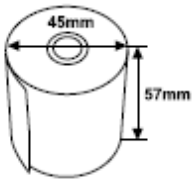
Biospace provides optional devices to make the operation of the InBody S10 more efficient and convenient. For more information, contact the Biospace or authorized distributors of Biospace.

A. Thermal printer

Only the thermal printer provided by Biospace can be used with the InBody S10. The thermal printer should be connected to the serial port and it can be also used together with a regular printer. Please contact Biospace or the local distributor of Biospace for further information.

B. Roll Paper

Result sheet Size : Width 57mm
External diameter 45mm
Number of Rolls : 1 rolls / box



Appendix

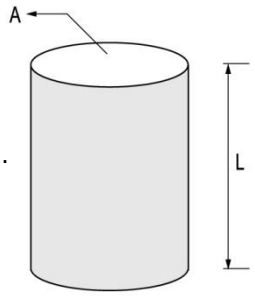
1. More about the InBody S10
2. Specifications
3. Customer Service Information

1. More about the InBody S10

A. How does BIA work?

The Bioelectrical Impedance Analysis (BIA) method is based on the fact that the human body consists of conductors and non-conductors. Generally, 50~70% of the human body consists of water which functions as a conductor, whereas body fat functions as a non-conductor.
The classic BIA method measures the impedance of the whole body on the assumption that the human body can be considered a cylinder for the application of this model. If A is the cross sectional area, and L is the length, the impedance of the cylinder can be expressed as follows.

$$Z = \rho\frac{L}{A} \quad (\rho = \text{resistivity})$$



If both sides are multiplied by L, We get the new expression as follows.

$$V = \rho\frac{L^2}{Z} \quad (V(\text{Volume}) = A(\text{Area}) \times L\ (\text{Length}))$$

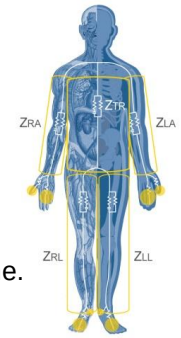
According to this expression, if we know the L and the impedance value, we get the volume. That is to say, if we know the height of the human body (acting as a conductor), and know the impedance value, we can get the volume of body water. Here, the volume represents examinee's height. Therefore, the two directly used variables in body composition analysis are impedance and height.

The principle of the InBody S10's body composition analysis is explained by the following; the volume of body water, an electrolyte, is calculated first with a measured impedance value. Then, we can get the value of fat free mass using the volume of body water. Body fat mass is determined by deducting the lean body mass from the measured weight.

Height should be entered by the user. Weight can be directly measured on the InBody S10.

B. Core Technology

The following are key features that make the InBody S10 extremely convenient, timely, and accurate.



Biospace

(1) Tetrapolar 8-Point Tactile Electrode
It was a complex and inconvenient procedure to attach and detach the electrodes to a specific spot every time. Trained technicians were needed for each measurement. The InBody S10 uses tactile electrodes to avoid the possibility of errors and inaccuracies. The 8-point Tactile Electrode method enables the InBody S10 to efficiently produce accurate data every time.

(2) Segmental Analysis
There are some claims to be able to estimate the body composition separately; there is no technology which can really measure it separately other than Biospace. Segmental measurement is the technology that assumes the body as five cylinders of four limbs and trunk and measures the impedance of these parts separately. Segmental body composition analysis provides segmental measurement of body water, muscle mass, and fat free mass. Furthermore, the analysis is highly accurate because the measured value of a certain part does not affect the measurements of other segments. It is because body composition analyzers lack accuracy in measuring body fat and cannot figure out the examinee's exact shape that they must rely on empirical references to correct inaccurate measured values. But, the InBody with the technology of segmental analysis can exactly figure out difference by gender, aging, disease and ethnic without any empirical estimation. Based on the fact that fat free mass (FFM) consists of about 73.3% of body fluid, it can be concluded that the distribution of body fluid reflects the distribution of FFM. Because the InBody can analyze the segmental body fluid distribution (each arm, trunk, and each leg separately), it can as a result examine a examinees segmental development.

C. Classifications

The product received classifications in the following:
Type of protection against electric shock : Class I
Type of the applied parts : BF Type
Degree of protection against water infiltration : IPXO
EMC Immunity : Level A EMC Emission : Level A
Equipment is not suitable for use in the presence of flammable mixture.

CAUTION

Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2. Specifications

Items & Standard	BODY COMPOSITION ANALYZER of Direct Segmental Multi-frequency Bioelectrical Impedance Method	
Bioelectrical Impedance(BIA) Measurement Items	Bioelectrical Impedance(Z)	30 Impedance Measurements by Using 6 Different Frequencies (1㎑, 5㎑, 50㎑, 250㎑, 500㎑, 1000㎑) at Each of 5 Segments (Right Arm, Left Arm, Trunk, Right Leg and Left Leg)
	Reactance(Xc)	15 reactance(Xc), phase angle(θ) measurements by using 3 different frequencies (5㎑, 50㎑, 250㎑) at each 5 segments (right arm, left arm, trunk, right leg, left leg)
	Phase angle(θ)	
Electrode Method	Tetrapolar 8point tactile/adhesive electrode system	
Measurement Method	Direct Segmental Multi-frequency Bioelectrical Impedance Analysis Method; DSM-BIA Method	
Body Composition Calculation Method	No use of Empirical Estimation.	
Outputs	Intracellular water, Extracellular water, Total Body Water, Protein Mineral Body Fat, Soft Lean Mass, Fat Free Mass, Weight, Skeletal Muscle Mass Body Fat Mass, Percent Body Fat, BMI, Segmental Lean Analysis Segmental Water Analysis, Total and segmental water ratio (ECW/TBW) BCM(Body Cell Mass), BMC(Bone Mineral Content) AC(Arm circumference), AMC(Arm Muscle Circumference) Waist Cir., Visceral Fat Area, Basal Metabolic Rate(BMR), TBW/FFM Body Water History (12times accumulated results) Impedance of Each Segments & Frequencies (Impedance, Reactance, Phase angle)	
Applied Rating Current	Under100uA(1kHz), 500uA(over 5kHz)	
Adapter	Power Input	AC100-240V, 50/60Hz, 1.2A
	Power Output	DC 12V, 3.4A
Display Type	800 X 480 Touch Color LCD	
External Interface	RS-232C 1EA, USB Slave 1EA, USB Host 1EA	
Compatible Printer	Laser/inkjet PCL 3 or above and SPL(Printer recommended by BIOSPACE) Thermal Printer (Optional)	
Dimensions	202(W) X 322(L) X 53(H): mm / 7.9(W) X 16.6(L) X 2(H) : inch	
Machine Weight	2kg (4.4lbs)	
Operation Environment	10 ~ 40℃(50 ~ 104℉), 30 ~ 75%RH, 70 ~ 106kPa	
Storage Environment	-20~ 60℃(-4 ~ 140℉), 30 ~ 95%RH, 50 ~ 106kPa	
Weight Range	10 ~ 250kg (22 ~ 551lb.)	
Age Range	3 ~ 99years	
Height Range	95 ~ 220cm (2ft. 9.5in. ~ 7ft. 2.6in.)	

* Specifications may change without prior notice.

3. Customer Service Information

Corporate agents of the InBody S10 and addresses are listed below. Contact us for assistance or more information about the InBody S10.

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518-10, Dogok 2-Dong, Gangnam-gu, Seoul 135-784 KOREA
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FAX: 82-2-501-3978
Website: www.e-inbody.com
E-mail: info@biospace.co.kr

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Homepage : http://www.biospaceamerica.com
E-mail : USA@biospaceamerica.com

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Homepage : http://www.biospace.co.jp
E-mail : biospace@biospace.co.jp

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